ELECTRICAL WEST

INTER-OFFICE **MEMO:**

To G.T. from Advertising Dept. Date March 10

Every electrical manufacturer can stimulate business and secure greater profits by using the June All-Industry, Convention-In-Print Number to put his sales message before the rich Western market represented by your 6,000 readers.

The electrical industry of the West, by aggressive, coordinated selling, is obtaining outstanding results that point the way toward permanent national recovery and prosperity. By sponsoring the 1935 Convention, the coordinated branches of the industry offer alert manufacturers an opportunity to make the most profitable advertising investment of the year -- an "exhibit" in the June issue of Electrical West. May we have the April front cover to tell this story?

Okay — GT

What an opportunity!!!

McGRAW-HILL COMPANY OF CALIFORNIA
PRICE TWENTY-FIVE CENTS FOR EACH COPY

You Sell It...
we make it work

There's plenty of room for aggressive, intelligent sales promotion on electrical devices for domestic, agricultural, industrial and commercial uses in a territory covering fifty-five thousand square miles in Southern California.

That's where we are adequately prepared to deliver electrical energy far in excess of the present demands. No fear of absorbing or exhausting our surplus capacity. We are ready.

1095 meals a year in every home mean new profit possibilities from electrical ranges every month in the year, every year. 30 gallons or more of hot water per family per day opens ample opportunities for promoting electrical water heaters. All the other devices trail after these major units and fill in the gaps.

With the lowest full use rates in the United States, dealers in Southern California have the best chance to lead the nation in the sale of all types of electrical equipment.

Edison

Not affiliated with any Holding Company

4-35

NRA Graphic Arts Code

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ELECTRICAL WEST

With which are consolidated the "Electrical Journal," the "Journal of Electricity, Power and Gas," and the Journal of Electricity."

ESTABLISHED 1887

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C. W. Leihy, Engineering Editor
Roy N. Phelan, Manager
Hans Hjorth, Typography

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883 Mission Street
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• POLITICAL hoodwinkery at its best has been employed in naming, or rather misnaming the Wheeler-Rayburn bill "holding company" legislation. It is aimed at the whole light and power industry—operating properties as well as holding company units. Every man and woman in the industry should know how it affects their jobs and their futures. President Markwart of the P.C.E.A. discusses the legislation in this issue (page 19) and the editors ask for united action against it (page 44).

• IN THE Engineering Symposium (page 34) there are two articles discussing operating problems of Northwest engineers, these papers being reports of the Engineering and Operations Section of the N.E.L. & P.A. The trials and tribulations of field maintenance on a water wheel generator are of human as well as engineering interest.

• PRESSURE is being put behind the sale of electric ranges in every section of the Far West. In this issue (pages 22-29) are articles describing the technique being employed from southern California to British Columbia. Electric ranges ought to be one of the most profitable appliance lines due to the tremendous all-industry promotion being put behind electric cookery.

• ELECTRIC sunshine has real public appeal if properly merchandised. One of San Francisco's leading department stores, The Emporium, put a sunroom on the main floor at the center of store traffic, staffed it with experts and gave free sunlamp treatments. Sunlamp sales zoomed, carrying with them all electrical appliances.

NEXT MONTH

• ALMOST 600 papers were received by the P.C.E.A. in answer to the problems published in the December issue of ELECTRICAL WEST. Winners will be announced at the conclave to be held in Fresno April 11 and 12. Next month's issue will carry a full report of this meeting as well as a complete list of all who entered papers in the contest.

• THERE will be an all-industry convention in the West this year. ELECTRICAL WEST has turned over to the industry its June issue for the third annual Convention-in-Print. It will be replete with constructive discussions, business-building ideas and critical analyses of industry problems.

Sales Talks that SOLD Appliances

CASE HISTORY
No. 4
SELLING AN ELECTRIC *Refrigerator*

BILL SMITH, master salesman, like all good business men, is looking for ways to build profits rapidly. Being critical of his own methods, he reviews his selling technique frequently to see if he is putting enough of the right kind of appeal into his presentation. In analyzing his refrigerator sales talk, Bill knew from experience that no matter what gadgets the manufacturer of his line of refrigerators brought out to help him put over the sale, the thing which would keep it sold successfully was what the refrigerator *would do for his customer*. So Bill wisely planned to make his strongest sales appeal on fundamentals. These, he knows, are: *food safety* and the *health* of his customer, plus the convenience of having such a useful and beautiful kitchen helper, and the economy which it makes possible in home management.

¶ A young woman paused to look at his attractive window display, and then walked into the store. Bill advances to meet her, fortified with the knowledge that he can offer her a new conception of comfort and utility in her home.

BILL: "I noticed you looking at that beautiful new refrigerator there in the window. Refrigeration is one of the greatest conveniences that electricity has brought to the home. May I show you our new models?"

PROSPECT: "I would like to see it but I'm afraid it's too big for us. We only need a small refrigerator."

¶ Bill senses that this is a defensive answer. He takes it to mean that she is interested in a refrigerator but feels that the larger box is too expensive for her purse. So he investigates to find what her requirements are. as they walk toward the floor display Bill introduces himself and learns that his prospect is Mrs. Jones.

BILL: "We have all sizes of cabinets and I will be glad to show you our smaller models. Now, if you will tell me how many there are in your family, it will help me determine the size of cabinet that will give you both adequate service and the greatest economy. It is our experience that careful selection of the right refrigerator for your household pays big dividends in the long run. Wise spending is necessary these days, don't you think, Mrs. Jones?"

PROSPECT: "It certainly is—and as there are five of us in the family we haven't any too much money to spend on such luxuries as an electric refrigerator."

¶ Bill discovers his customer's requirements and now knows that a small cabinet would be unsatisfactory. To sell her up to the larger model he will have to put across the basic story of refrigeration to get the greatest value for her money.

BILL: (placing a chair before a medium-sized model) "It does seem to be a luxury, doesn't it, but if you will sit down here and be comfortable I will explain some of the advantages, conveniences and real economies that have made the electric refrigerator a popular necessity in millions of homes."

MRS. JONES: *(protesting)* "But this isn't the model I intended to look at. Can't we look at a smaller one?"

¶ At the risk of being too insistent, Bill parries her protest because he is trying, against his prospect's judgment, to sell her the model that will be of greatest value to her. Watch how smoothly he calms the prospect's fears that she is being "high-pressured."

BILL: "Certainly, I'll show you the smaller cabinets in just a few minutes. But before I do, and with your permission, I would like to tell you certain facts that apply to all sizes of refrigerators, small or large. When you thoroughly understand the things that will make electrical refrigeration so useful and profitable to you, we then can determine upon the size of the cabinet. *(Mrs. Jones sits down)* Electric refrigeration is really a three-in-one investment. First, it is a delightful modern way to prepare delicious, healthful and appetizing salads and desserts—dishes that permit a delightful variety for your menus and add to the enjoyment of the whole family. The second and probably most important feature is the health protection it provides. It maintains your food supply at a safe temperature, keeps the children's milk sweet and healthful—below the danger zone—where there will be no spoilage even if you leave it in the refrigerator a week or more. That's worth a great deal, isn't it, Mrs. Jones?"

¶ Notice how Bill translates every sales point into something of definite advantage to his prospect.

MRS. JONES: "Yes, it is, but I'm sure a refrigerator like this is a luxury that we could not afford at this time."

BILL: "I can see that you are a good judge of value, Mrs. Jones. That's why I know you will be interested in the third reason which prompted my statement that electric refrigeration is a three-in-one investment. It is a method of making real savings on your food bills. I know from experience of hundreds of my customers that an electric refrigerator actually pays for itself out of the money it saves in food bills."

MRS. JONES: "I've heard of such things but I don't quite see how it can be done. At least I'm not sure I could save enough to pay for it that way."

BILL: "You are very prudent to take such an attitude. Yet so many of our customers have come in and told us that they are doing just that thing that our company has prepared this little booklet of actual experiences in the economy of electric refrigeration. Now, when you know that food perishables, especially, will keep for days without spoilage, then you can watch for grocers' specials and take advantage both of these and the ability to purchase in quantities, both of which will save you many dollars a month. Another saving which ordinarily isn't thought of with the electric refrigerator is the saving in fuel used for cooking. After you find just how delicious dishes prepared in the refrigerator can be, you'll find yourself "cooking" with cold more and more. Another fuel saving is the ability to cook in larger quantities with absolute assurance that the left-overs will keep in perfect condition and perfect safety until you can use them."

MRS. JONES: "I hadn't thought of that. I can see where some real economies could be made in that way."

BILL: "And there are still other economies. If you operate on a budget as do most housewives, you'll appreciate the savings that can be made through preventing spoilage of the food. How often have you had to throw out a half pint of cream, a quart of milk, or a box of berries because they were not kept in the proper temperature? It is true that these savings may represent only a few pennies each, but multiply them many times every month and you'll find that they will very nearly equal the few dollars a month that will place this beautiful model in your kitchen."

MRS. JONES: "I suppose all of that is true, but I didn't want to go so much into debt. Wouldn't a smaller box do all of these things, too?"

¶ Bill does not argue. He agrees with the prospect first and then goes on to show why she needs and can afford to buy only a refrigerator large enough to give complete service to her family.

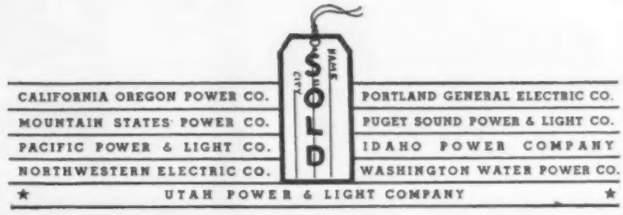
BILL: "Yes, it is true that you can get food protection and a place to prepare new and delightful dishes in any size of box. But the way to be sure that these conveniences will pay for themselves is to have a refrigerator with ample storage space to permit the savings of quantity purchases, and buying during sales when prices are low. The few extra dollars that the larger box costs initially are the dollars that really make the big savings of electric refrigeration possible; with the larger cabinet you are certain of its ability to pay for itself in quantity purchasing."

BILL: "Now, Mrs. Jones, I know that it is difficult to appreciate what a wonderful convenience this handsome, modern refrigerator is until you have used it. Over 1,300,000 American women became enthusiastic users last year and I know you too will be just as enthusiastic when you find how this refrigerator will modernize and improve the appearance of your kitchen, simplify the running of your home, bring convenience and comfort to the whole family, and at the same time permit savings that will take care of the small monthly payments of our convenient budget terms. The only way to really prove all of this is to begin using it right away and find out for yourself. Why not let me send it out in the morning?"

MRS. JONES: "Yes, I suppose you might as well. It's a larger refrigerator than I had intended to buy but I can see where the larger size has its advantages."

BILL: "Thank you, Mrs. Jones. I feel sure that you will be well pleased with your wise decision to take this model after you have used it a few days."

¶ Bill, in this demonstration, has presented only the basic refrigerator story interpreting electric refrigeration in terms of advantages to the user. On every refrigerator there are certain features which the salesman can and should use to expand this basic presentation. Too numerous to mention here, they are very definite aids in maintaining interest in the story. Obviously because prices and terms vary, these also should be incorporated in the sales talk. Bill's presentation is sound and dealers and salesmen who adapt it to their own product will profit by a greater number of sales per prospect.



CALIFORNIA OREGON POWER CO. | PORTLAND GENERAL ELECTRIC CO.
MOUNTAIN STATES POWER CO. | PUGET SOUND POWER & LIGHT CO.
PACIFIC POWER & LIGHT CO. | IDAHO POWER COMPANY
NORTHWESTERN ELECTRIC CO. | WASHINGTON WATER POWER CO.
★ UTAH POWER & LIGHT COMPANY ★

NEW GRACE AND BEAUTY

Westinghouse *White Swan*

AUTOMATIC ELECTRIC RANGE

A NEW ACHIEVEMENT IN BEAUTY, EFFICIENCY, QUALITY

Unique new construction makes this the whitest white range you ever saw. Every proportion and line carries grace. Women will stop to admire it . . . and when they learn the price, your sales will speed smoothly ahead.

Here is the ideal, ultimate range for rental and long term financing. Why? Because it has highest quality, backed by a name you can depend upon. Instead of being built down to its low price, your own most thorough examination will prove that every smallest detail is built to the highest quality standard of modern electric range manufacturing science. Based on our experience with hundreds of thousands of Westinghouse ranges now in service, we confidently expect that the new "White Swan" model will serve on your lines with the lowest upkeep expense of any range ever built!

Space here permits only high spots of the story. Mail the coupon for complete information — and for facts on the Year-Round sales plans with which Westinghouse will help you speed the rate at which you can add cooking load.

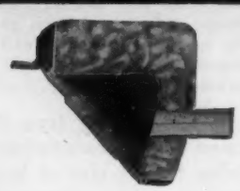
FINEST SURFACE UNITS

Scientific double brick, insulating block, solid terminals. A new high standard in efficiency, speed and long life.

MILLION-DOLLAR THERMOSTAT

Culmination of a lifetime endeavor to control heat *simply* . . . with absolute dependability . . . erasing service problems.

THERMO-TITE OVEN



E. T. L. report on the "Cardinal" gives it lower thermal loss than the average of 26 other ranges tested. The "White Swan" is even *better* insulated.

AT A CHALLENGING PRICE

THE WESTINGHOUSE "WHITE SWAN"

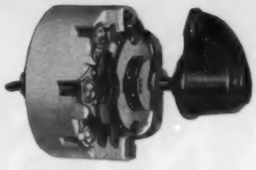
Structural steel, welded chassis. Acid-resisting porcelain top; porcelain front and splasher. New height of 36" and flush sides make it ideal for building into counter work surface.

ONLY $79.50 LIST

(TIMER EXTRA)

F. O. B. MANSFIELD, O.

3-HEAT SWITCHES



Load-Balancing . . . Universal. Identical with those on our highest-priced ranges. Tangible evidence of the superior quality of the "White Swan."

PILOT AND OUTLET

The pilot light demonstrates dramatically the high oven efficiency. Goes on and off with thermostat operation. Note outlet, too.

MAIL COUPON NOW!

Westinghouse Electric & Mfg. Co.,
Merchandising Division, Mansfield, O.

Give me more information about the "White Swan" model; and your plans for speeding year 'round range sales.

Company.....

Attention of.....

Address.....

Cut Costs With
CORRECT
LUBRICATION
UNION Red Line Lubricants are absolutely pure, of low carbon depositing qualities, and free from sulphur or any harmful acid-forming compounds. That is why they provide insurance against overheating, undue wear, and expensive shutdowns. Also, by eliminating excessive frictional losses they frequently reduce power bills.
Many western power plant, factory, and mill operators have proved, through actual experience, that Union Red Line Lubricants materially reduce operating costs per day.
Union Oil Company engineers, over a period of years, have developed a scientifically correct oil or grease to fill every electrical demand.
Get This Valuable Free Service!
Whenever lubrication problems arise, call the nearest Union representative or write the Lubricating Oil Department, Union Oil Building, Los Angeles, for the free services of Union's staff of engineers. These experts have often been able to reduce lubrication costs from 10 to 25%—yet gain increased efficiency!
Call or write today. This service is absolutely free.
UNION OIL COMPANY
UNION LUBRICANTS
"LOWER LUBRICATION COST-PER-DAY"

SALES RECORDS *Fell!*
When WES HICKS *Built*
this Wesix WATER *Heater*

●

Wes Hicks and his engineering Staff designed a WESIX Water Heater that enabled P. G. & E. to increase its annual revenue $95,000 without any additional capital expenditures

HOW WOULD YOU like to have $95,000.00 additional annual revenue without additional capital expenditure?

This is exactly the result traced to the sale of 2,349 Wesix water heaters in 11 months by the Pacific Gas and Electric Company and its cooperating dealers.

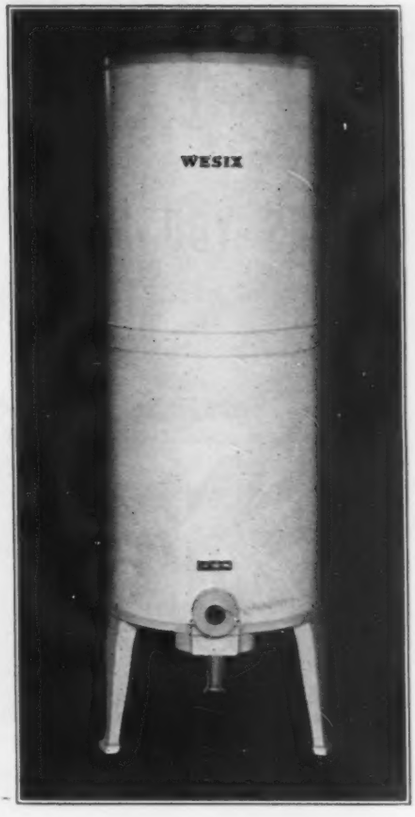
Such a record was accomplished through an advanced Wesix design of a water heater and load limiting switch, which made it economical and profitable for consumers to take advantage of the PG&E rate offer of a 1c lower block. So unique was the Wesix accomplishment that the power company did not need to increase its service facilities in order to serve the increased load.

SOUTHERN CALIFORNIA UTILITIES BENEFIT!
TVA Models Build New Load

WESIX, the only manufacturer in the West qualified to make TVA model water heaters, has revived interest—created new markets—and improved the standard of electric water heating in Southern California.

Carloads of electric water heaters—both the popular TVA model and "Boulder Dam Specials"—have been sold where only a meager demand existed before.

Wesix has always earned the water heater business where quality, merit of product, and sensible prices are appreciated.



Milestones of Wesix Leadership

- THE first practical electric water heater was invented by Arthur Kercher and Wes Hicks, and manufactured by Wesix.
- WESIX was the first to improve water heating service by introducing speedy heating elements, dependable thermal control, and adequately insulated tanks.
- WESIX was the first to introduce and advocate the use of non-corrosive tanks, such as copper, Everdur, and Monel Metal.

▼

WESIX INC.
390 First St. San Francisco

A·C·S·R·

GIVES YOU MANY PLUS ADVANTAGES

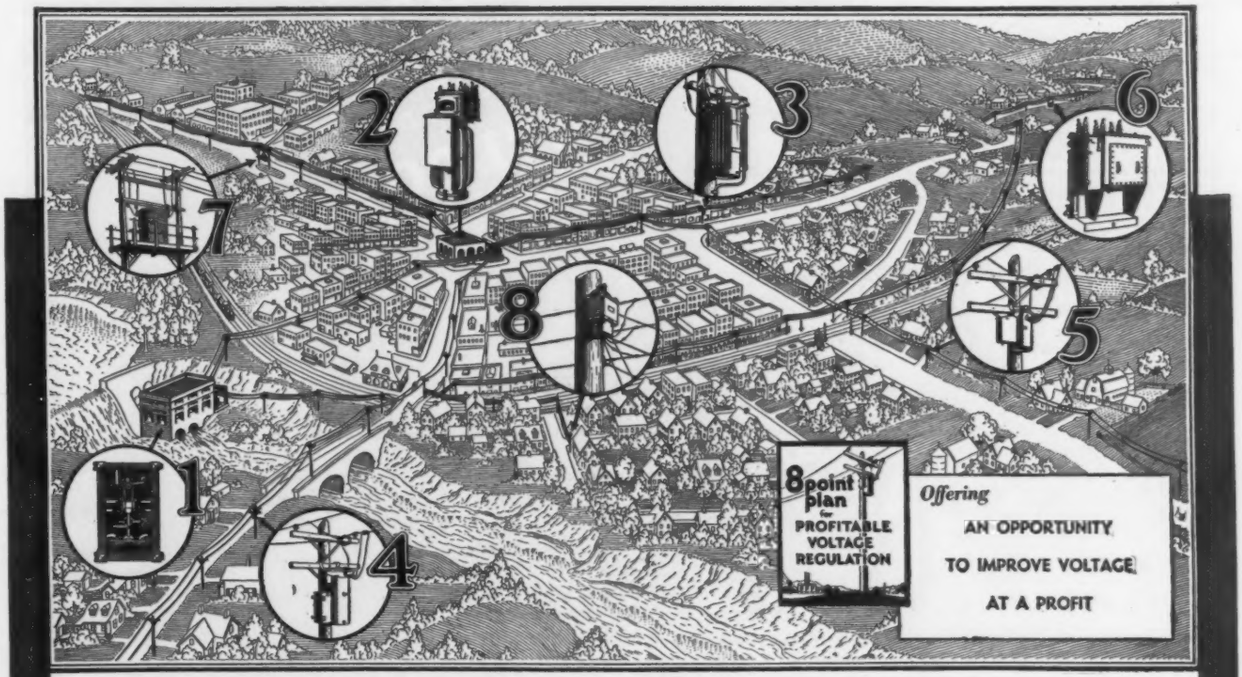
● The economy of A. C. S. R. begins as soon as it is written into the specifications. The number of towers, their design and location, are affected advantageously. And it is being demonstrated repeatedly that A. C. S. R. shows real savings both in the time and cost of stringing.

The year-round reliability of A. C. S. R. yields a basic economy too important, too vital, to be stated in cold figures. Its high strength-weight ratio gives an extra factor of mechanical safety. And because, when flashovers do occur, the arc moves and causes only surface burns, A. C. S. R. gives you one more factor of safety. For the steel core, which provides 50 to 60 per cent of the strength of A. C. S. R. is permanently protected by the Aluminum strands.

Our engineers will gladly cooperate without obligation even in working out any tentative transmission project you may have before you. ALUMINUM COMPANY OF AMERICA, 1832 Gulf Building, Pittsburgh, Pa.

ALCOA ALUMINUM

Announcing...
the 8-POINT PLAN
for Profitable Voltage Regulation



1 New Automatic Generator-voltage Regulators
2 Station-type Induction Feeder Voltage Regulators
3 New Branch-feeder Induction Voltage Regulators
4 New Branch-feeder Step Voltage Regulators
5 New Branch-feeder Step Voltage Boosters
6 Step-voltage Regulators for Higher-voltage Circuits
7 Series Capacitors for Reducing Lamp Flicker
8 Autotransformers for Reducing Lamp Flicker

THE 8-POINT PLAN offers you an economically sound solution of the complex problem of complete system voltage regulation.

As every distribution engineer knows, it is not always economically feasible to regulate completely long or heavily loaded feeders by regulators installed only at the station. It is apparent, therefore, that a complete and comprehensive line of voltage-regulating devices is necessary for the economical solution of this problem.

Now that the new regulators and other equipment presented by the 8-POINT PLAN are available, we believe that your regulation problems can be economically solved. Each device outlined in the plan plays a definite and helpful part, and they fit together in such a way that an organized method is provided for improving voltage at every vital point on the system. Their application will aid you greatly in solving voltage problems—and with a profitable return on the investment.

For the complete 8-POINT PLAN address the nearest G-E office, or General Electric, Dept. 6C-201, Schenectady, N. Y.

350-113

GENERAL ELECTRIC

AMERICAN STEEL & WIRE COMPANY

United States Steel Corporation Subsidiary

Pacific Coast Distributors

COLUMBIA STEEL COMPANY

SAN FRANCISCO LOS ANGELES PORTLAND SEATTLE

★ Less Arcing Time
★ Lower Maintenance
★ Wider Application

Expulsion Port Breakers

As a result of several years of testing and experimental work, Allis-Chalmers engineers have developed an improved type of oil circuit breaker for use in Armorclad Switchgear. This Expulsion Port Breaker, although not differing greatly in mechanical construction from previous Allis-Chalmers designs, has incorporated in it an arc extinguishing principle which makes it very much more efficient.

ADVANTAGES OF THE EXPULSION PORT BREAKERS

1—Arc interruption is accomplished much easier and with lower internal pressures and consequently the factor of safety of the breaker is greatly increased.

2—These breakers are oil tight and do not throw any oil under service conditions.

3—The oil deterioration and contact deterioration is enormously less than in a standard breaker, which means that the maintenance required by these breakers is very much less than previously necessary.

4—The arcing time of these breakers is materially shorter and consequently the short-circuit interruption is attained quicker.

5—These breakers are not sensitive to variations in current value and therefore are efficient as arc interrupters through a wide range of current. This enables the breaker to be applied on various service voltages with the assurance of the same interrupting performance as at the rated voltage.

Allis-Chalmers Western Sales Offices

Denver, Colo.	Continental Oil Bldg.
Los Angeles, Calif.	Rowan Bldg.
Phoenix, Ariz.	Luhrs Tower
Portland, Ore.	220 S. E. Belmont St.
Salt Lake City, Utah	Kearns Bldg.
San Francisco, Calif.	Rialto Bldg.
Seattle, Wash.	Smith Tower

Armorclad switchgear is designed by engineers with 28 years of metal-clad experience behind them and the best of engineering laboratories in which to develop and test new designs. It provides the maximum of safety, reliability, performance and dollar value.

ALLIS-CHALMERS

— Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin, U.S.A. —

NEWS!

FOUR YEAR PROGRAM OF RESEARCH SOLVES THE PROBLEM OF BRUSH UNIFORMITY ON HEAVY DUTY SERVICE

THE NEW "SA" SERIES . . . FOR HEAVY DUTY D. C. POWER SERVICE!

FUNDAMENTAL brush properties essential to satisfactory performance on heavy duty service have been more accurately determined.

New combinations of materials possessing these properties have been developed.

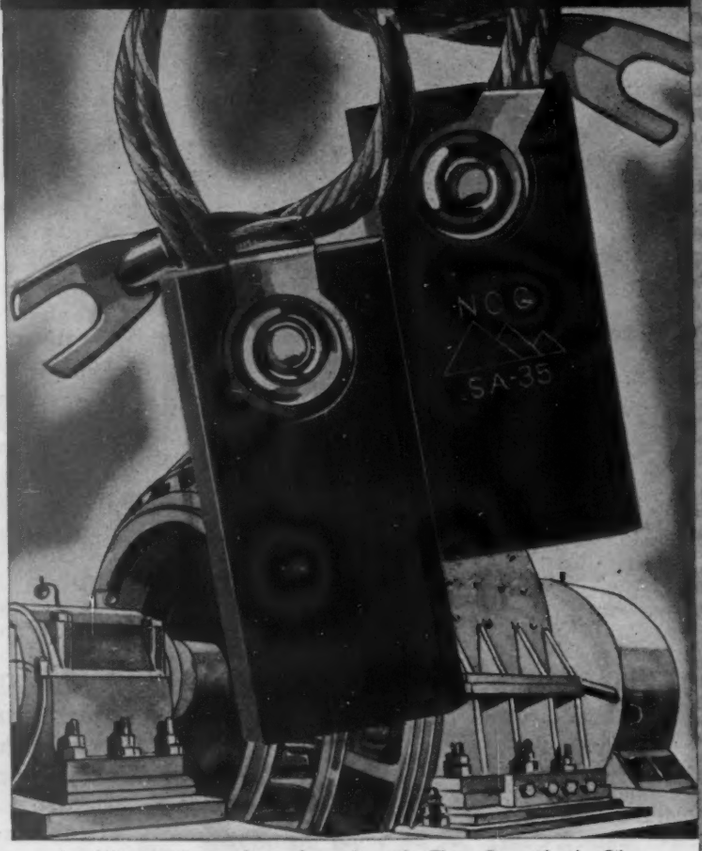
Exact methods of production insuring control of uniformity have been devised and established.

The result is the New "SA" Series of brushes designed for a wide range of applications on all types of stationary motors and generators used on heavy duty direct current power service.

The New "SA" Series consists of five carefully determined grade varieties known as SA-25, SA-30, SA-35, SA-40 and SA-45, all definitely graded with respect to commutating properties.

The exceptional uniformity of the grades in the "SA" Series has been fully established by field service tests. This uniformity applies to performance as well as to the mechanical and electrical characteristics of the brushes themselves.

Further information on the advantages and economies of these new grades in your particular service will be supplied upon request.



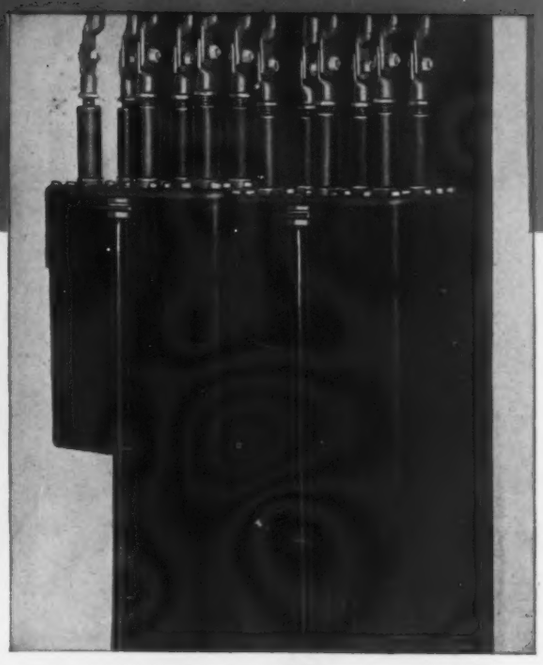
In addition to the regular trade marks — the Three Pyramids, the Silver Strand Cable and the Grade Number — these new grades are further identified by the Double Engraved Lines (Trade Mark Registered) down the center of one side of the brush.

NATIONAL CARBON COMPANY, INC., Carbon Sales Div., Cleveland, Ohio

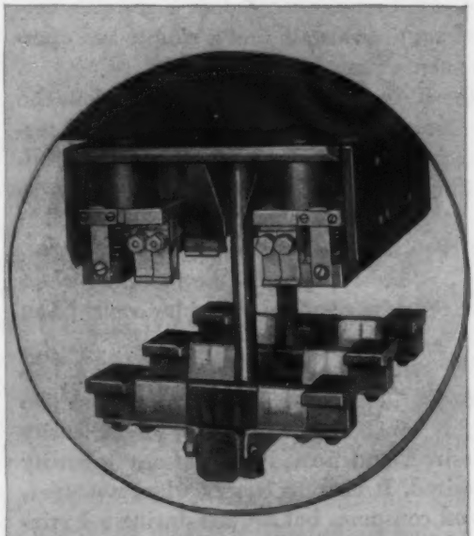
Unit of Union Carbide UCC and Carbon Corporation

BRANCH SALES OFFICES: NEW YORK PITTSBURGH CHICAGO SAN FRANCISCO

NOW AVAILABLE Oil-blast Breakers for Panel Mounting



GENERAL ELECTRIC INTRODUCES A NEW BREAKER—TYPE FK-43—WITH IMPORTANT IMPROVEMENTS



Long life without maintenance is assured by extra-heavy contacts of the latest design

★

Universally applicable—fits the job where required to interrupt load every few minutes or where operated only once a year.

Maintenance reduced materially because of the silver-to-silver current-carrying contacts, and solid butt-type interrupting contacts that will stand thousands of operations.

Requires 35% less floor space because of its single tank, and because of the oil-blast principle of interruption, which also increases the reliability of operation.

Any mounting—panels, cubicles, in cells, on pipe framework. Manually or electrically operated.

RATINGS: 600 amp., 15,000 volts, 50,000 kv-a.; 1200 amp., 7500 volts, 50,000 kv-a. Described in Bulletin GEA-2050. General Electric, Schenectady, N. Y.

810-50

GENERAL ELECTRIC

Automatic Illumination Control

SIMPLE AND SURE THE WESTON WAY

. . . economical, too!

Model 709
Weston Illumination Control Relay
The upper relay can be adjusted for any "turn-on" value from ½ foot-candle up; the lower relay for any "turn-off" value from ½ foot-candle up.

Model 709
For Interior Illumination Control
Furnished in attractive case for wall mounting . . . adjustments can be made in "on" and "off" values without removing cover.

Model 709
For Outdoor Control
Furnished in cast weather-proof case; light target also mounted in weather-proof case.

Investigate the PHOTRONIC method of illumination control. It's simple and dependable. It has many exclusive advantages that make it the most practical for street lighting, indoor illumination, airways, lighthouses or outdoor signs. It's economical, too; for installation is simple and operating expense practically negligible.

It's the Weston Model 709 which employs the Weston PHOTRONIC Cell . . . the fundamental reason for its efficiency and economy. This self-generating cell, which has permanent characteristics, operates the relays direct. No outside voltage required . . . No amplifying equipment. The cell, or light target, can be mounted wherever desired; far removed from the control box if necessary.

And Model 709 permits of independent adjustment of both the "on" and "off" values; so that lights can be turned "on" at any intensity level desired, and turned "off" at any intensity level desired. It uses no energy when not operating, and consumes but 2 watts during a 1 minute operating cycle.

Other advantages make Model 709 ideal for your use. Obtain all the facts. Write for bulletin . . . Weston Electrical Instrument Corporation, 577 Frelinghuysen Avenue, Newark, New Jersey.

WESTON *Instruments*

PACIFIC COAST REPRESENTATIVES

Eicher & Bratt,
263 Colman Bldg.
Seattle, Wash.

C. F. Henderson,
420 Market St.
San Francisco, Calif.

Electrical Engr. Sales Co.
Subway Terminal Bldg.
Los Angeles, Calif.

BETTER LIGHT . . . . BETTER SIGHT

Another step toward BETTER LIGHT

NEW PRICES

WATTS	TYPE	WAS	NOW
15	Inside frosted	20¢	15¢
25	" "	10¢	15¢
40	" "	20¢	15¢
60	" "	10¢	20¢
75	" "	20¢	20¢
100	" "	25¢	35¢
150	Clear	50¢	55¢
200	Inside Frosted	70¢	60¢
200	Clear	75¢	90¢
300	Inside Frosted	$1.15	95¢
300	Clear	$1.25	$1.55
500	Inside Frosted	$1.75	$1.65
500	Daylight	$1.85	35¢
100	Clear Daylight	40¢	65¢
100	Inside Fr. Daylight	90¢	70¢
100-200	Indirect Three-Lite	95¢	$1.00
150-200	Indirect Three-Light	$1.40	$1.20
200-300	Indirect Three-Light	$1.50	$1.90
250	Indirect-Lite	$2.40	90¢
		$1.10	

New low MAZDA lamp prices will help bring up lighting standards.

With General Electric's announcement of substantial price reductions in the most popular types of Mazda lamps, effective April 1st, another significant step is taken toward the goal of Better Light for Better Sight. Following closely upon the tremendous impetus to lighting created by practical applications of the New Science of Seeing, this step paves the way for far greater residential and commercial lighting service. No utility executive can fail to grasp immediately the significance of these price reductions and the opportunity they create for the still greater expansion of utility lighting promotion and revenue. Now, opportunities to make the most of nation-wide interest in better lighting are suddenly mobilized into immediate calls for action. Filling empty sockets . . . putting on your lines the higher wattage lamps that everyone wants but which previously were substantially higher in price . . . placing plenty of spare lamps in every home . . . these are some of your immediate opportunities to increase lighting loads by virtue of the new low prices on Mazda lamps of General Electric manufacture.

In every way these price reductions are a distinct step toward our mutual goal — to bring lighting standards up to minimum requirements for safe and easy seeing.

General Electric Company, Nela Park, Cleveland, Ohio.

GENERAL ELECTRIC

ALWAYS DEPENDABLE

...that sums it up

ROEBLING MAGNET WIRE is drawn in Roebling's own mill . . . one of the largest and most up-to-date copper drawing mills in America. It is made to the exactingly high standards which are traditional at Roebling.

Round, square and rectangular types. A wide range of gauges. A comprehensive variety of coverings including cotton; asbestos tape and cotton; silk; enamel; paper; enamel and single silk; enamel and single cotton.

Over 60 other types of Roebling Electrical Wires and Cables are also available.

JOHN A. ROEBLING'S SONS CO. OF CALIF.
San Francisco · Los Angeles · Seattle · Portland

ONLY A FINE PRODUCT MAY BEAR THE NAME ROEBLING

Youngstown
YOUNGSTOWN
BUCKEYE
CONDUIT
In Youngstown's laboratories scientists are constantly probing deeper into the uncharted areas of steel metallurgy. From their tireless experiments emerge new alloys, more accurate processes, anticipating the demand of tomorrow's industries.
THE YOUNGSTOWN SHEET
AND TUBE COMPANY
Manufacturers of Carbon and Alloy Steels
General Offices - YOUNGSTOWN, OHIO

Enthusiasm is running high

FOLLOWING FRIGIDAIRE'S NATIONAL CONVENTION

★

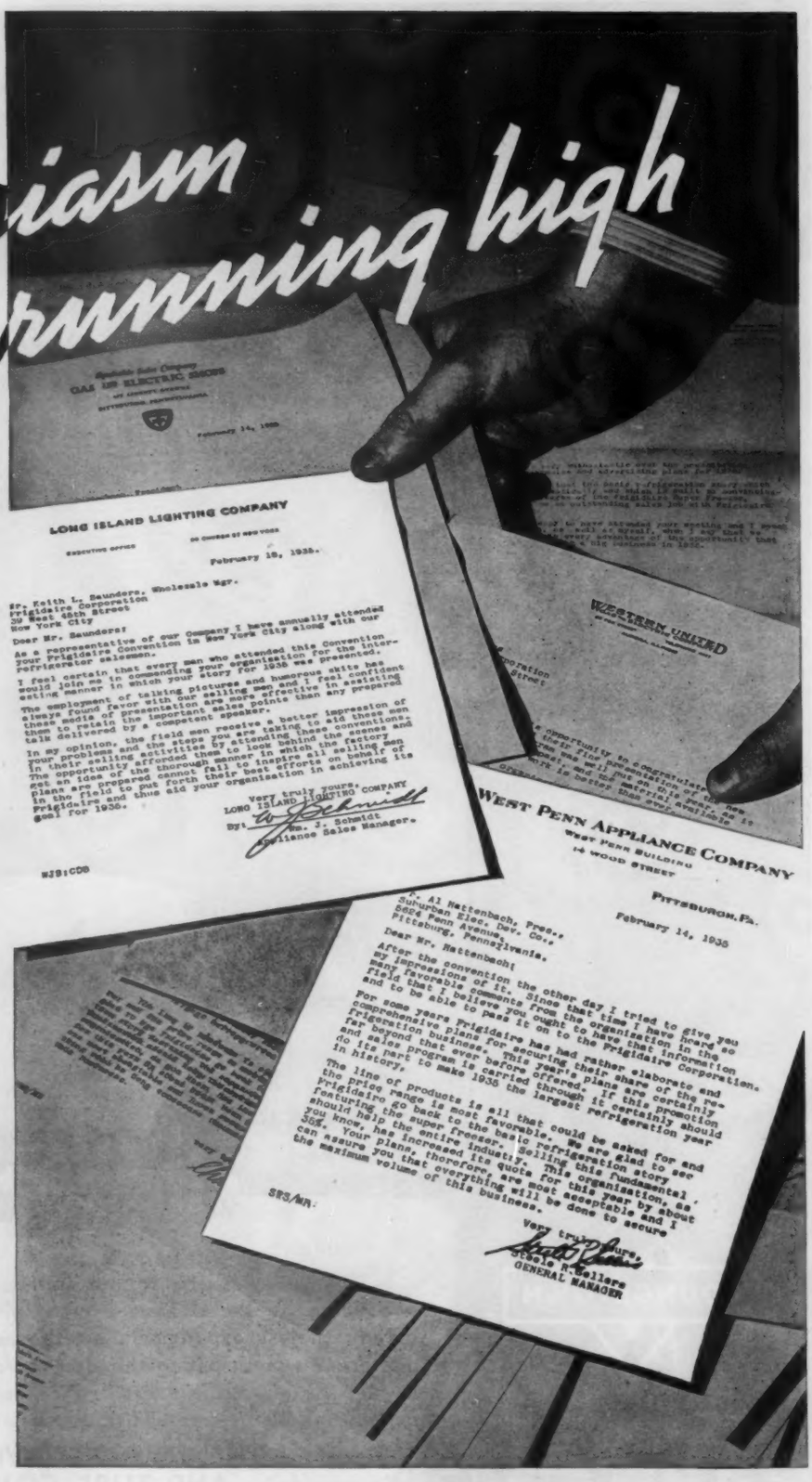
DEALERS HAIL THE FRIGIDAIRE SUPER FREEZER AS THE GREATEST SALES PRODUCER IN YEARS

Enthusiastic reports are rolling in from Frigidaire dealers. And everywhere the verdict is the same. Dealers acclaim the Super Freezer as one of Frigidaire's greatest developments—*a development that can be relied upon to bring in business.*

And this enthusiasm is not based merely upon expectations. It is based upon definite, tangible results—*sales that are being made right now.* The season has just started, but the Frigidaire '35 is moving into homes in numbers that leave no doubt about what this year holds for Frigidaire dealers.

The Frigidaire household line for 1935 is one of the most complete we have ever offered. There are 16 models. Some with Dulux exteriors and porcelain interiors. Some with Lifetime Porcelain inside and out. And every model from the smallest to the largest has the Super Freezer!

The Frigidaire franchise for 1935 gives you a real line and a real product to sell. And back of that line and that product we're putting the weight of one of the most impressive advertising campaigns in Frigidaire history. Shall we send you complete information? Frigidaire Corporation, Subsidiary of General Motors Corp., Dayton, Ohio.



FRIGIDAIRE '35

THE GENERAL MOTORS REFRIGERATOR

ELECTRICAL WEST

[*Devoted to the economic production, transmission and distribution of electric power and its application to industry, commerce and the home in the Pacific Empire, and to the sale and distribution of electrical utilization devices, equipment and appliances in that area*]

April 1935

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Reformation by Ruination

By A. H. MARKWART
President, Pacific Coast Electrical Association

LEGISLATION which has been introduced in Congress to eliminate public utility holding companies and to dominate operating companies is the culmination of violent political attack that has been carried on against the alleged "power trust" for a number of years.

While I do not desire to submit a brief for holding companies, I, as an American believing in our traditional honor and fair play and as an individual knowing something of the situation, would be derelict in my duty did I not assert that the proposed congressional action is unjust and highly detrimental to millions of innocent investors in holding and operating company securities and woefully distressing to even more millions of American citizens. I have no hesitancy in declaring that the enactment of the proposed legislation in its present form should be prevented, to the end that the public's investment in utility holding company securities be salvaged instead of destroyed.

As an employee of an operating company, the integrity of which is beyond question, I must, in self-preservation, do what I can to protect an industry which has engaged my attention for many years.

My modest savings largely have been invested in my own and other operating companies in which I have confidence. Therefore, as an investor I feel that I should oppose actions by the government which will tend to lower or perhaps even destroy the value of my investments.

The legislation proposed is unnecessarily drastic and not warranted or justified by facts. If, as has been alleged, there have been isolated instances of evils and abuses among some holding companies, we must find out what they have been and then, if they cannot be prevented in the future by the Securities and Exchange Act, let us act without malice and establish regulations that are not intentionally punitive and destructive.

To the "man on the street" the efforts of the government carry a tinge of sadism, are vicious and are designed not only to punish the holding companies for selling securities but also, by destroying whatever value still remains in the securities, to punish the investors for having had enough money to buy them. On its face, the bill claims to protect investors against certain holding company abuses. But what sort of protection is it that destroys the property of those to be protected?

Anyone giving the subject any thought at all must realize that the securities possessed by the holding companies themselves cannot readily be distributed to the holders of the various classes of holding company securities. Nor can the holding companies in a short period of time sell their vast holdings to retire their own outstanding bonds and preferred stocks except at a tremendous loss, thus rendering the holding company common stocks valueless. Mature consideration will reveal that, if there is a dumping of holding company assets onto the market, there also will be a sympathetic lowering of the value of common and preferred stocks, and perhaps bonds, of operating companies not held by holding companies.

Would it not be wiser and more in the public interest to view the situation rationally and dispassionately, and finally adopt some scheme of regulation that would cause holding companies and their securities to be subject to the same rules and regulations as operating companies if it appears that better safeguards are desirable?

Aside from the alleged excessive management charges by holding companies against their operating companies, it is the welfare of the investing public that is concerned. The leadership of holding companies will offer no opposition to sound and necessary regulation.

The outcry, particularly from some quarters, is against the so-called "power trust" and it arises out of electric utility consolidation, especially that effected through the agency of the holding company.

There is nothing new in consolidation. It has been going on for years, not only with the utilities but also with the railroads and other forms of business. It is in the public interest. But when the electric utility industry resorted to consolidation, and after the major work had been substantially completed there were protests, murmurs that state regulation had broken down and movements directed to government ownership. Now severe but redundant Federal regulation threatens.

If consolidation is construed in terms of increased rates, it will and should develop antagonisms. But when judged in the light of improved service at lower cost, it should be welcome. Informed opinion holds that no consolidation is

justified in these days of economic enlightenment which does not benefit the consumer.

It is apparent that spokesmen for the utilities have not made it clear that consolidation, or rather integration that has been done in the physical and capital structure equation of the electric utility properties is in the public interest nor has the public been made aware that such a thing as a "power trust" and what it might imply in the way of price movement by those in control is not only unthinkable from a business standpoint but impossible under state authority which is exercised over operating companies that have been or should be integrated either by way of merger or of holding companies.

Apparently the sincerity of those in the electric utility industry who have made utterances regarding the low cost of electric service is questioned. They seem not to have satisfactorily demonstrated that the prosperity of the industry depends upon the contribution it has made to other industry in the form of lowest possible rates. Contrarily, many erroneous notions have been impressed upon the public by demagogues, organized socialistic propagandists and proselytizing government ownership leagues, concerning the scope, quality and price of electric service and the utility industry's conception of the proper trend, economically and socially, of modern power.

In order to maintain low rates to the consuming public, economy and efficiency must obtain. These can be had only by mass operation through the agency of large instruments of production and undivided distribution. These in turn call for physical and/or capital integration. Despite the pronouncements of the leadership of the electric utility industry that low rates to consumer by reason of decreased costs is the objective, those of radical economic views are creating the impression that the objective is large profits to monopoly in the control of individuals by reason of increased net revenue, and that consequently such integration is dangerous to the consuming public. This impression must be dispelled or private progress will be checked; thus the picture of the functions of the modern public utility as painted by its sponsors will be blurred or wiped out.

No consumer of electricity has ever suffered in the matter of rates and quality of service since integration has been practiced in the electric utilities, because for many years rates have had a consistently downward trend and the quality of service an upward trend. This is true even if some of those who have done the integrating have gained through their financial ingenuity in commercially developing the unused physical values of operating utilities often cheaply acquired. Such gain may be justified on the ground that it falls in the class of legitimate enterprise profit which is approved by most people in the general case, and should be in this case because the consolidation which made the gain possible also benefited the consumers of the output of the electric utility industry.

Those who are fully informed on the economics of regulated private industry know that actual value of physical property, used and useful in the doing of the business, and not the capitalization of a company owning physical property or collateral, is the basis for determining the annual return to an operating company. They know that a total made up of this return plus the actual expenses of operation and maintenance and an allowance for depreciation goes to make up the annual income which is spread into rates for the several classes of service, all as authorized and approved by a state regulatory body.

Since this is the method of determining rates, no consumer need concern himself with a "power trust," with "watered stock," or with the fact that a merger or holding company might have paid too high a price for or issued too much stock to acquire an operating company.

In general, before a state regulatory commission permits any merger of intrastate property, it, in effect, rules that the purchase price of a property shall have no bearing on future rates unless it is supported by actual physical value. It is true that any price can be paid for an operating property, in the case of a purchase by a holding company, outside the purview of a state body. In such a situation regulatory bodies are not concerned, nor is the particular consuming public adversely affected because the rates of operating companies are determined by the regulatory body of the state in which the consumers take service.

Subject to sound regulation, in the consuming public interest, integration should continue until completed. It is an economic requirement, not an abstract theory. Although state commissions are not authorized by law to enforce consolidations, in time they may encourage consolidation of separate electric utility properties in their states, if the utilities are slow in bringing about what obviously seems to be in the consumer interest. This would reduce the number of utilities to be regulated.

While the state commissions must leave the correction of such situations to voluntary action of operating companies or to the initiative of holding companies, they doubtless will welcome the opportunity to pass on proposals to integrate when these seem to promise savings for the consumer, even if the rights of private proprietors are potentially enhanced in the process.

An electric utility is an intimate thing in its relations with the public, the consumer and the regulatory body. All these factors in a given state look more favorably upon a company which, if not home controlled, is at least home managed. Conflicts inevitably would arise were the citizens of one state served by a public service company of another. What the consumer in one state got in the way of relief on a complaint might be claimed by the consumers of the other states, irrespective of the elements that governed the decision in the state where it was made.

Consequently a merger company is ideal for intra-state business. For interstate business, however, the holding company is the best that has been offered in the way of a corporate activity to bring about desirable integration. The holding company serves to advantage the same purpose in intra-state business in those regions in which no single operating company is sufficiently dominant to effect the necessary merger of utility properties. Under these circumstances, relations with the consumer, the commission and the public have approached those of the strong merger company, to the degree in which the holding company management has appreciated and understood local problems and difficulties.

Notable achievement in the electric utility industry is its broadening sphere of public service in general welfare. This idea of business working for the fulfillment of social obligations has been so marked in the electric industry as to represent an advanced view of the opportunities, responsibilities and functions of all business in our times.

Will the electric utility industry continue to rise as it has during the period of those now living for the benefit of future generations or will it fall under bureaucratic domination in our generation? The answer to the question will be determined by the attitude of the public of our times toward consolidation, so favorable public opinion must be maintained by the industry, even at the risk of further criticism of its motives and investigation of its activities. The defensive fight to prevent a sacrifice on the altar of demagoguery must be carried on, even if more punishment and further reprisals result.

The vindictive and unjust legislation which threatens should be vigorously opposed in the interest of the consuming public, the public utility industry and those who have invested their savings in it.

Fiction and Fairy Tales

ELECTRA is like a lot of other wives. Every now and then she gets on the subject of how good things were in 1929. *Some* of the advice we got in those merry days was good. That goes for a squib from Thomas A. Edison which I ran across in some old notes. Here it is:

"We shall steadily require more power, but a great deal more fuss is being made over hydro-electric power that it's intrinsic value warrants. The first and best source of power is coal . . .

"We have within a few years doubled the efficiency of coal, but it is still only about 20 per cent as contrasted with the 90 per cent efficiency in hydro-electric power. Water power is a political issue, not a business one. It can never, at the best, mean very much to us except as something to talk about. The monopolizing of water power is also just a political issue. The rates are fixed at any point by the cost of generating power from steam. . . .

"There is far more danger in public monopoly than there is in private monopoly, for when the government goes into business, it can always shift its losses to the taxpayers. If it goes into the power business, it can pretend to sell cheap power and then cover up its losses.

"The government never really goes into business, for it never makes ends meet. And that is the first requisite of business. It just mixes a little business with a lot of politics and no one ever gets a chance to find out what is actually going on."

And that was in 1929—not 1935.

•

UNCLE SAM is having difficulty in finding ship designers and marine draftsmen, according to the Federal Civil Service Commission. Frequent examinations have been held but few men have qualified during the past year. One Navy Department executive has been quoted as saying that the government has been at the mercy of a few private shipyards which had pooled their resources and maintained a joint design staff of experts during the lean years.

Electra's Husband would have no cause for noting this had he not looked into the engineering department of one of the power companies recently. Empty desks and drawing boards, scores of them. Some old-timers, twenty-year men and upwards. Some of the original workers at the desks and boards had been transferred to other departments, accepting demotion rather than dismissal. The others have gone with industrial concerns or into other lines of work.

Naval construction has been dormant in this country for perhaps fifteen years. Utility construction has been negligible for the last four or five. One of these days the utilities may find themselves in the same predicament as Uncle Sam. Design and engineering staffs cannot be organized overnight from recent college graduates.

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THERE are more ways than one of making the public tax conscious. An engineer friend suggested a good one recently. His company's tax bill increased by the trifling sum of $1 million last year. With a slide rule he figured that this increase was equivalent to supplying electricity free to all of the residences in a city of 115,000 people. The average residential customer uses approximately $33 worth of electricity in his territory. The $1 million tax increase to be paid was equivalent to 30,000 customers. Counting five people to a family that's a city of 115,000. Simple but highly effective.

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ELECTRA'S husband is the modern counterpart of the court jester who was privileged to comment on the foibles and peccadillos of royalty and nobility without fear of retaliation. It would be an unbalanced society indeed if there were no legitimate outlet for criticism. Part of the present difficulty in our national administration lies in the fact that the Great Man surrounded himself with yes-men and there was no one permitted to suggest that a certain idea was a lot of bunk.

Electra's husband's comments are not to be taken so seriously as judicial decisions—their main purpose is to arouse interest and provoke discussion.

All of which is preliminary to explaining that a criticism of lamp designers in the March issue brought forth a two page, single space technical explanation with the suggestion that Electra's beautiful floor lamp might be out of date. Electra's husband does not intend to show this explanation to Electra. Did you ever hear of a woman being interested in a technical explanation of a perfectly simple complaint? Besides the floor lamp is a beautiful thing, it cost thirty-five dollars, and Electra's husband contends that even in the interest of standardization, simplicity and efficiency, the tail should not wag the dog.

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ELECTRA thought her husband was reading romantic pulp fiction or fairy tales the other night when he failed to turn out the lights until after 2 a.m. He wasn't. The engrossing volume was entitled "Annual Report of the Tennessee Valley Authority for the Fiscal Year Ending June 30, 1934." Highly interesting reading, it proved to be.

For instance, at the close of the fiscal year TVA was serving at wholesale three small communities and two power districts having a total of 6,555 customers of which only 4,825 fell in the residential classification. And to think of all of the nationwide publicity has been given to an enterprise serving about as many consumers as Richmond, Calif.! Franked mail and free printing, evangelists, radio orators, journalists, writers and politicians have made the big ballyhoo.

Then there was the subject of employees. One project at the time the report was written had 44 employees in the construction engineer's office with an annual payroll of $112,480, ten construction foreman, $25,400 and only 71 construction workers at $90,180. Total number of salaried employees of TVA was 2,315 and the authority had 6,125 hourly and eight daily workers or a total of 8,448—part of the 90,000 new ones of the present administration.

There were some interesting paragraphs on discretionary surcharges that make the widely advertised low rates something else again. In one case the surcharge permitted during a load building period was 10 per cent of the total gross bill charged the customer plus one cent per kilowatt hour for the first 100 kw.-hr.

Maybe Electra was right about the fairy tales or romantic fiction.

Cooperation on Parade + + +

[*Forecast of forthcoming cooperative merchandising activities, and review of activities in progress or completed, a summary of cooperation at work throughout the West*]

Field Assistance to Dealers Makes Cooperation Actually Work

THE very heart of any cooperative program is a personal responsibility somewhere to see that it works. Plotted upon a chart or written up in organization form and sent by mail it will remain little other than a beautiful theory which has never been tried. But given enthusiastic workers to stimulate it at just the right time, to call attention to its features and to point out the very tangible results which can come to the dealer from cooperative effort on his part and the word cooperation ceases to be merely a well-used term and becomes a very definite means of adding to the dealer's income.

This is what the Electric Appliance Society of northern California has found in the operation of its program over a widely scattered area. In the words of one of the field directors in her report, "I discovered that dealers all the way along the territory had not taken the campaigns as seriously as they might have done, thinking them just 'another one of those things'. In consequence, there was practically no merchandise to work with in the stores of the dealers after they had loaned what they had in stock to the power company offices for a joint display.

"In most cases, however, the dealers have proved marvelously cooperative and with time and system, wonderful things can be done in this part of the country.

"In most cases, ironers just sit on the floor, and no one knows the first thing about them. The wholesale men have spent very little time with their dealers and weeks go by without them calling. Most of the washers are ordered by mail and the dealers find out what they can about them from the book of directions."

It was found everywhere that because of poor business conditions this situation had developed. More infrequent calls by salesmen upon dealers and less time to spend with each one to bring out the sales features of the appliances offered, had left the dealers impoverished as to actual selling ammunition. Even in the metropolitan areas the larger dealers were paying little attention to appliance sales until these appliances were brought into sharp focus by the work of the educational directors, Miss Gladys Byrne and Miss B. M. Hixon.

At the beginning of 1935 a remarkable increase of interest in appliance sales on the part of the large retail outlets has been noted. In fact a record of 1934 indicates enlargement and enhancement of appliance departments by all types of retail outlets.

One excellent example of the effectiveness of this field work, related by Miss Byrne, was at the store of the Gernhardt-Strohmaier Co., Oakland. This firm had specialized in stoves for many years, with a large store on Mission St., San Francisco. Later a store was opened in Oakland. Little or no attention was given to electric appliances until W. Cooper, manager of the appliance department, was made aware by the society's work of the genuine sales opportunities in appliances. Now one-half the main floor of the Oakland store is devoted to appliances—refrigerators, washers, ironers and vacuum cleaners. One window is constantly in use for window demonstrations.

MISS GLADYS BYRNE

Under Miss Byrne's direction an Ironrite demonstration, using three separate methods of obtaining prospects, was used. But first, all of the sales people were trained to iron and demonstrate an ironer. The three systems used to get prospects were as follows:

1. *Card system*—On an easel beside an ironer being demonstrated were a series of cards listing ten or fifteen features relative to the particular make of ironer. These were pointed to by the demonstrator or an assistant during the logical development of an ironing demonstration.

MISS B. M. HIXON

2. *Sidewalk*—While a demonstration was going on, trained salesmen were on the sidewalk talking to the crowd of people invariably attracted by the demonstration, inviting them into the store for a personal demonstration of the ironer or other appliances.

3. *Towel Method*—Familiar to all manufacturers, whereby each one who comes in and tries the ironer herself is given free a hand towel. This gives an opportunity to teach her the ease of operation and to get the feel of doing ironing by sitting down. Such an offer is usually advertised extensively.

These methods have converted what formerly was a passive sales organization, as far as electrical appliances were concerned, into a very active one. During refrigeration campaigns it now runs hostess schools, makes frozen desserts and takes advantage of every sales opportunity. Naturally, it is getting a fine volume of business from appliances sales and is making this one of the most important departments of the company.

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• EL PASO ELECTRIC CO. has revived its range rental or trial plan which was so successful in gaining load last year. The plan also applies to 30-gal. Hotpoint water heaters. A rental of $1.95 per range and $1.75 for water heater, or for both combined, $3.40 monthly, are included in the present campaign.

Calendar of Cooperative Activities in Northwest

A calendar of dealer cooperative activities in the territory of the Puget Sound Power & Light Co., includes a number of unusual programs. February and March just closed a national running water program. In March, April, May and June it has been announced that a "free electricity offer" will be made to stimulate appliance selling and to recapture lost load. May and June are scheduled to have general appliances featured with a special stress on laundry equipment.

July and August a home modernization essay contest will be conducted and in August and September the running water program will again be resumed. September and October will begin the emphasis on lamp sales, along with a fall range, water heater and refrigerator campaign scheduled for September, October and November. November and December naturally will feature the complete appliance line for holiday sale.

Throughout the program dealers will be supplied with appropriate window and display material, sales plans and programs to tie in with these featured items. Announcements in favor of the dealers will be made in advertising and over the radio programs, and a close personal contact and sales cooperation will be maintained in the field.

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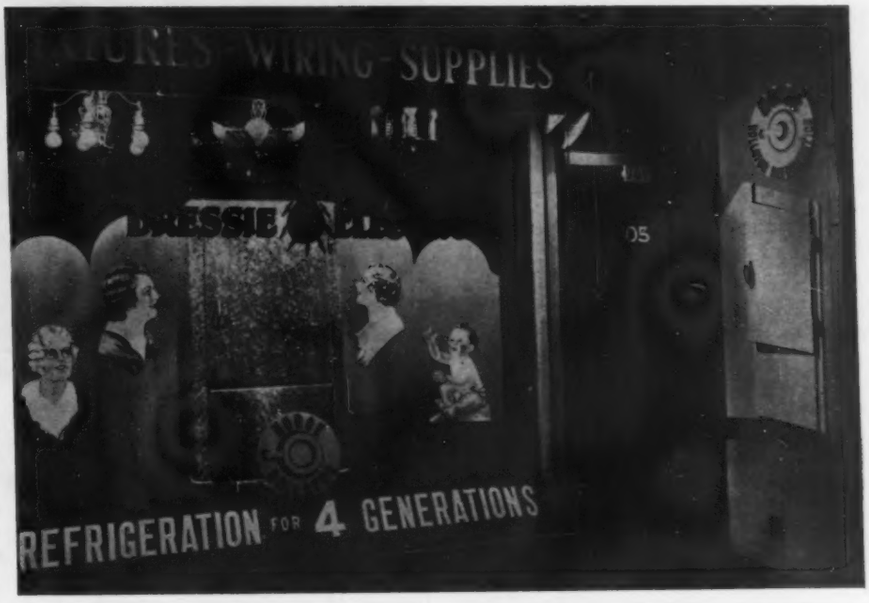
Dealers and Edison Co. Stage Ironer Campaign

Opportunity to try out ironers for themselves in a widely publicized offer to housewifes has been responsible for materially increasing dealers' sales of ironers in the two territories of the Southern California Edison Co. Ltd. where the plan was operated. Pomona district was first to try the plan and a second campaign is on in Santa Ana. Each runs a period of four weeks.

Calling in the distributors to invite participation, 18 makes responded to a call for a meeting. When details were finally worked out, five manufacturers advertised through their dealers in the Pomona area and during the four-week period 40 ironers were sold and 70 more ironers were on trial from which a number of sales are expected.

The offer made to housewives was that upon visiting the Edison display room or the nearest dealer's the housewife could make a comparison of the various makes, select one she would like to try and have it delivered to her home for a 10-day trial offer. The 10-day period would be long enough to complete a two weeks' laundry. A limit of 70 machines on trial was set so that the thing could be kept under control.



Attention-getting display for a refrigerator sales campaign was obtained by Bressie Electric Co., Portland, Oregon, with a replica of a refrigerator fabricated from plywood. Incidentally, the idea plus the attractive window trim won a prize in a recent Norge contest

A series of standard advertisements to cover the campaign, one to run each week, has been worked out by the advertising department. Cleverly using the entire spread for a banner line with the cooperating advertising running below the main head, domination of a page is obtained in each case. Besides emphasis of the free trial, the time-saving and labor-saving advantages of electric ironers are heavily stressed throughout the selling campaign. It is planned to take this campaign to the various districts.

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Refrigerator Replica Attracts Prospects

While the window display shown here was one of the cash prize winners in the recent Norge contest, there is a feature wholly apart from the window itself which is decidedly original.

To the right of the doorway is a replica of a refrigerator which can be seen for a considerable distance by anyone approaching the store from the direction in which it faces. It is made of plywood, white enameled, and fitted with the standard Norge hardware. In every way it exactly resembles a real refrigerator.

Y. C. Bressie, proprietor of the Bressie Electric Co., Portland, Ore., who originated the idea, has this to say concerning it: "The likness is so realistic that each day many try to open the door of the replica before realizing that it is not a real refrigerator."

Incidentally, Mr. Bressie reports that his sales of refrigerators in 1934 far eclipsed his refrigerator sales in any other year since he has been in business. The attractiveness of his store interior and the careful attention he gives to his window displays are no doubt factors in his increasing business. He is one of the leading strictly electrical retailers in Portland and was recently elected president of the Portland Electric Club.

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• SINCE VERY EXCELLENT USE is made of the cooking school idea as a means of promoting the sale of ranges and refrigerators in its territory, the Southern California Edison Co. has standardized much of the procedure incidental to preparing such a school. The schools are usually sponsored by dealers or a local newspaper in conjunction with the utility. A series of ads has been prepared by Advertising Manager R. G. Kenyon which require only the name of the city, the hall in which it will be held, the name of the sponsor and of the home economist in charge, be inserted upon publication. The first ad is a preliminary announcement; the second announces the second day of the school; the third ad announces the third day of the school and the fourth ad is run after the school is finished, summarizing some of the points brought out in the demonstrations. This procedure has been proved by accurate tests to bring increased sales to the dealers cooperating with such a school.

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• "NOBODY who ever acquired one of these fine refrigerators ever bought it," said V. E. Vining, of Westinghouse Electric Refrigeration Department, in a series of recent sales meetings on the Pacific Coast, as he added laconically, "it's a gift—from the ice man."

B. C. Electric Sells Ranges on "Pay Like Rent" Plan

COOPERATIVE action between the B. C. Electric Railway Co. and all electrical contractors and retailers in the territory it serves forms the outstanding characteristic of its 1935 sales plan for the promotion of electric range sales and building up of domestic load. Under this new plan, long term payments are being offered.

The electric range featured, in addition to carrying the Hotpoint name will have the name "BEECEE" in the lower left hand corner of the oven door panel. The range is finished in two-tone ivory with receptacle wired for installation of automatic timer, which retails for $15.85 and must be purchased separate.

This range is being offered at an installed price of $160. When the contract is signed the customer is asked to make three monthly payments of $2.00 each and his next two dollar payment becomes due at the start of the fourth month. When the customer has made 65 consecutive monthly payments of $2.00, thereby paying $130, the company cancels the balance of the contract amounting to a further $30 and gives the customer a receipt in full. Should the customer's house be wired, the contract price is reduced to $120, and the customer makes 60 consecutive payments of $1.50. When such a customer pays $90.00 he receives a receipt in full. From its revenues derived from sales, the company sets aside $12.00 to be paid to the dealer in semi-annual payments of $3.00 each commencing six months after the installation of the range. The company is grouping dealers' sales so that payments on all outstanding contracts will be made at the end of June and December in each year. In the case of discontinued services by customers sold by the dealer, unpaid portion of the dealer's bonus is cancelled.

Dealers are supplied with special appliance cards for their customers to sign. When signed dealers forward them to the company's range sales supervisor, who investigates the customer's credit and if satisfactory has one of the company salesmen present the regular contract to the customer for signature. In securing the customer's signature the dealer need collect no down payment, the power company attending to this when signing up the customer. The dealer's only responsibility will be the securing of the application card. Installations will be made under contract with members of the Vancouver Electrical Assn. on a flat rate.

An electric range will be supplied to established electrical dealers for display in their showrooms on consignment. Dealers without facilities may take their customers to the nearest B. C Electric salesroom and have the range displayed by the company's sales staff. The entire crew of outside range salesmen of the central station are also at the services of independent dealers in the closing of their sales. Where a company salesman sells a range outright to a prospect provided by a dealer, instead of signing the customer on a long term payment contract, the dealer is paid the same commission of $12. A definite system has been organized for the filing of prospects by dealers and prior claim is given to the dealer who files the prospect's name first, although if another dealer goes out and actually closes the sale with the prospect he is entitled to secure the commission. Salesmen of the B. C. Electric itself receive exactly the same bonus on sales made by dealers as if sold by the company direct, it being sought in this way to eliminate all element of competition.

B. C. Electric services the range during a period of one year. After this guaranteed period the customer is charged at prevailing rates. Coal ranges may be traded in, the B. C. Electric assuming the responsibility for appraisals. Any allowances made are credited to the customer's account but used only to reduce final payment. If a customer is using a gas or electric range, however, and wishes to replace this, it is possible to take advantage of the long term payment plan. But to do so the old gas or electric range must be turned in to the B. C. Electric Railway Company, and any claim for allowance forfeited.

In cases where ranges sold on these terms are re-possessed the customer not only agrees to lose all monthly payments but also to lose a trade-in allowance credited against the final payment.

Extensive advertising is being used by the B. C. Electric Railway Co. to back up this campaign which began March 1 and runs until further notice. Dealers in turn are requested by the central station to feature these special ranges in their own advertising and to display them prominently in their windows and store interiors. All the territory served by the company on the lower mainland of B. C. and Vancouver Island and Kamloops is included in the 1935 sales plan.

In the case of customers desiring to purchase more expensive styles of ranges than that featured in the special offer, or wishing to pay cash or use the short term payment plan which is regularly operated by the company, special inducements are given.

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• GLOBE ELECTRICAL AFTER APPLIANCE SALES—One of the old, established electrical wholesalers in Seattle, the Globe Electric Co., has decided to take up the sale of electrical appliances as a major activity. As the first step, it has taken on the line of refrigerators, washing machines and radios manufactured by Fairbanks-Morse & Co. Said D. U. Chamberlain: "In getting back into this field, we were anxious to get a line that would have a name back of it with which the public would be familiar, and likewise one in which there would be sufficient financial backing and organization. The Fairbanks-Morse line is one which qualifies in these two respects. We are making plans now to become very active in this field."

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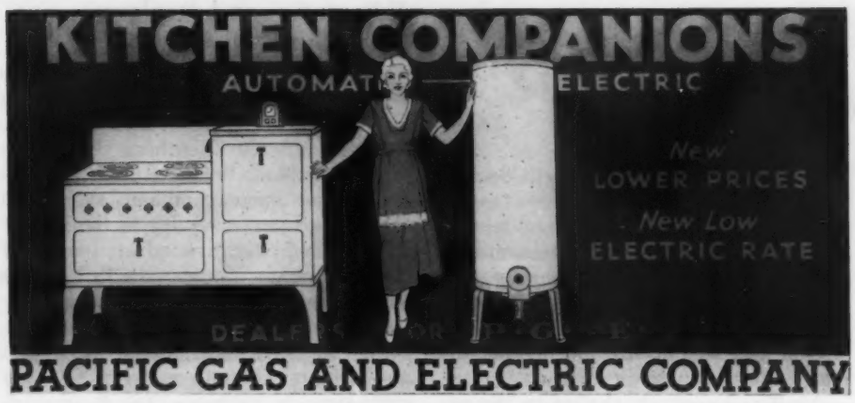
Sense of Touch Sells

A highly developed sense of touch was the principal reason for the recent sale of an electric refrigerator, according to R. K. Akin, Sales Promotion Manager of the Westinghouse Electric and Manufacturing Company, Portland, Oregon to Mr. and Mrs. J. F. Myers, instructors in the Oregon State School for the Blind, who are themselves totally blind. This is the first purchase of a major electrical appliance by two persons who are unable to see the product they were getting, it is believed. The refrigerator, Akin explained was subjected to probably the most unique and unusual tests ever given such a product. Mr. and Mrs. Myers live in a home that is completely equipped with electrical equipment



Billboards were an important sales aid

Sales Record on Water Heaters Broken by New Rate

SO attractive were the features of the Pacific Grand Electric Co. electric water heater sales plan last year that many of the cold prospects were induced to install both an electric range and water heater. Some 2,479 electric ranges were installed also during this water heater campaign throughout the year 1934, which produced a total of 2,349 new water heaters in 11 months, with its new 1c rate.

A year ago the P. G. and E. Co. placed its DW rate in effect. It offered a low block of 1c for domestic customers who were using an electric range and water heater provided that the water heater was so connected that the combined load of the two appliances would not exceed 5 kw. The inducement offered by this rate, under these conditions, consisted of a reduction of the low block on domestic schedules from 1½c to 1c.

The theory behind this rate was the assumption that the maximum demand of an electric range would be approximately 5 kw. and by means of this rate it then became practical to install an electric range and water heater together or add an electric water heater to an existing range installation without the necessity of increasing the facilities necessary to serve. In analyzing the problem to determine the size of water heater to be featured for operation under this rate, it was decided that a 3 kw. water heater constructed with external circulation to give rapid recuperation would be the most satisfactory, the water heater to be so connected with an automatic control which would open the water heater circuit when the range load exceeded 2 kw. A special Wesix water heater with these characteristics was developed and sold.

The average daily use of an electric range is between 4 and 5 kw.-hrs. This means that the electric service is available for maintaining a full 30 gallon tank of hot water for approximately the entire 24-hour day, the full 30 gallon tank of hot water being always sufficient to carry over ordinary domestic hot water usage during the short periods of the day when the electric range was using a demand in excess of 2 kw.

Experience indicated that a great majority of customers had previously used their water heaters intermittently. Under the new rate with the water heater as described, it appeared practical and much more convenient for customers to have a continuous domestic hot water service which would cost approximately $40.00 per year or in the neighborhood of $3.35 per month.

This plan has now been in effect for eleven months. During that time the company has had installed on its lines 2,349 new electric water heaters. This compares with approximately 1,403 water heaters installed during the corresponding eleven months of the previous year.

A survey was made a few months ago which indicated that the original assumption had proved out in practice inasmuch as it was not necessary in any case to add to the service facilities in order to serve the electric water heater load. Thus the company was able to add $95,000 in annual business with no additional capital investment.

A further survey was made to determine the satisfaction of customers who were taking advantage of this offer and it was found that customers in general were permitting their water heaters to operate continuously and that they were receiving a very satisfactory service both from the standpoint of quantity of hot water, cost of operation, and convenience.

It is anticipated that the sales for the next eleven months will appreciably exceed those for the past eleven months due to the enthusiasm of users. The quota, therefore, of electric water heaters for the entire year of 1935 has been set at 3,000. This system has an advantage over other systems in that it does not involve timing devices or separate meters for recording the water heater consumption which would add to the work involved of reading, computing and billing for each individual water heating service.

A very timely and unusually helpful feature of this new DW rate of P. G. and E. Co. is that it gave to salesmen something new to talk about, something concrete to offer to the prospect, and a real saving and added convenience to customers. A low priced quality water heater was selected with full automatic features. A load limitor was carefully designed and engineered to insure perfect operation. A standard installation layout was drawn up and supplied to all electrical dealers with complete specifications for installation, etc. Other sales features included free wiring installation in exchange for competitive fuel range and flat wiring charge for new installations, dealers being permitted to quote the same price as the P. G. and E. for wiring, the company absorbing the difference.

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• MEIER & FRANK CO., Portland department store, opened its refrigerator season March 10 with full-page newspaper copy featuring seven different makes of refrigerators. The lines handled include General Electric, Westinghouse, Frigidaire, Norge, Kelvinator, Crosley and Grunow.

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• SEVENTEEN ELECTRICAL DEALERS of Phoenix, Ariz., in cooperation with the Central Arizona Light and Power Co., staged a cooperative sales campaign featuring a new Silex coffee maker at terms of 95 cents down and 70 cents per month for a six months' period. An allowance of 50 cents was made for an old coffee pot and a pound of coffee was given with each coffee maker sold.

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• H. E. SAVIERS & SON, INC., electrical dealers of Reno, introduced the new 1935 Westinghouse refrigerators recently with an evening show, a feature of which was a ten-piece band to furnish entertainment. In addition, door prizes were given to all those visiting the store that night.

Intermountain Groups Merge for Business Drive

TWIN workhorses of the electrical industry in the Mountain states, the Rocky Mountain Electrical Association and Electrical League of Colorado have merged their resources and personnel to form a closer and more powerful coalition for the 1935 Tri-state Business Development program.

The new organization setup is headed by a potent joint advisory council of which Guy W. Faller, vice-president and general manager of Public Service Company of Colorado, is chairman. Acting under supervision of this advisory council are the boards of directors of Electrical League of Colorado and R.M.E.A., each headed by their respective presidents, E. E. Brazier and G. B. Buck. Though both groups will operate in unison on all promotional enterprises, there is a sharp dividing line to their provinces. Denver will be the special domain of Electrical League of Colorado; its man-power and finances will be devoted to local enterprise. Outside this area in Colorado, Wyoming and New Mexico, R.M.E.A. will operate carrying promotional messages to all utilities, dealers and merchandisers of electrical goods. However, committees in one group will collaborate with those of the other on all projects, in order that pre-arranged selling campaigns may synchronize throughout the entire Rocky Mountain Region.

Another important change in the organization scheme is that Rocky Mountain Electrical Association expects to establish local units in the various communities it serves. Thus, when yard and garden lighting season arrives in Denver—an activity in which Electrical League of Colorado functions most admirably—the event will be fostered by local chapters throughout R.M.E.A. territory.

Furthermore, electric range and air conditioning are to have a more prominent spot in the new program; also power sales and wiring. Special committees have been appointed to prosecute these vital activities with increased vigor.

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Rocky Mountain Program

Appliances suggested by national events, which live dealers can feature in the way hinted by the Rocky Mountain Electrical Association, will bring sales results anywhere in the West

APRIL—BETTER HOMES WEEK, EASTER and HOME SEWING WEEK occur this month, each providing splendid opportunity to promote electrical devices. Sewing week is from the 4th to 9th. It affords a good time to feature sewing machines. The spring house cleaning season is on full force, providing a sound excuse to promote cleaners, laundry equipment, etc. The radio season is waning—except for auto radios, which begin to be in season. Better Homes Week begins the 28th. Wiring and refixturing should be urged during this period. Before this time, however, you should begin your refrigeration promotion, the peak of which will be in May. Communicate with your distributors, who will provide attractive window trims and other promotional material, some of which ties in with the idea that Better Homes need Refrigeration. Appliances scheduled for April are: auto radios—laundry equipment—vacuums—motor-driven appliances, such as humidifiers, razor blade sharpeners and hair dryers.

MAY—BETTER HOMES WEEK continues until the 5th. CHILD HEALTH DAY, a National event, occurs on May 1. It provides opportunity to impress upon parents the necessity of electric refrigeration for the protection of the children and other members of the family, MUSIC WEEK, from the 6th to 12th, provides opportunity for a last fling at indoor radio and a splendid argument for auto radios —with which to catch the wonderful programs. MOTHER'S DAY, the 13th. Electrical appliances as gifts provide long-time happiness, comfort and convenience. About the 15th, begin to stress table appliances and other electrical devices which will gladden the heart of the annual crop of JUNE BRIDES. Not only the June bride, but the approach of warm weather dictates continuous promotion of table appliances, such as waffle irons, perks, coffee makers, egg cookers, casseroles, toasters and toaster sets, clocks, irons, mixers, fans and motor-driven appliances.

JUNE—The first week build about the idea that people are buying summer necessities—for the yard, garden, porch and outings. Yard and garden lighting equipment is growing vastly in public favor. And don't overlook a continuation of the June Bride motive. And the graduates. Home laundry equipment, irons, mixers, clocks, fans and table cookery appliances should receive unceasing promotion. It goes without saying that you will be near the peak of your refrigeration activity.

ELECTRIC COOKERY will be promoted in May and June. The coolness, comfort and convenience of electric ranges and cookers will be promoted locally and nationally probably on a scale never before equalled.

LIGHTING, for protection as well as convenience, was stressed during January and February. February, March and April will find lamp campaigns in favor. The new Study and Reading lamp will continue to be featured, as will portable lamps of all styles. Residential lighting, based on the "Better Light-Better Sight" movement was stressed during January, February and March.

Edison Co. and Dealers Start Big Range Drive

Timed strategically to strike the market simultaneously with the great spring push on ranges using competitive fuels, dealers and the Southern California Edison Co. Ltd. launched their big major spring range campaign on March 20 with an unusual offer to the public. On March 21 the first advertisement of the campaign appeared in papers throughout the territory of the company surrounded by advertising space carrying the individual makes of ranges and dealers' signatures, tying into the campaign.

Special inducement of the campaign was a no cash down and no payment for 30 days offer with free installation in practically all homes. The special feature of the first advertisement was the statement that "you can buy a modern 1935 electric range for as low as 10 cents a day."

Slogan for range drive

In order to prepare the dealers for this campaign upon the very shortest notice, meetings were called in each division on March 20 and the outlines of the campaign told to local dealers. The extension of the financing plan of the company on ranges and water heaters so that they could be purchased with no down payment and the first payment to be made 30 days after signing a contract was offered the dealers at that time. Henry Rice, manager of merchandise sales, predicted that it would be the greatest range sale in the history of the region and would signal the beginning of a tremendous public interest in electric ranges and water heaters which dealers could capitalize upon throughout the year.

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• BON MARCHE, Seattle department store, featured a Housewares Fair during one week of March at which Mrs. William Irma Sayles, home economist for the Malleable Iron Range Co., gave daily demonstrations and lectures on electric cookery, using the latest cabinet type Monarch electric range.

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• O'CONNOR MOFFATT & Co., San Francisco department store, has announced the opening of a newly enlarged refrigerator department which specializes on Frigidaire, Norge and General Electric refrigerators.

Sun Room Sells Sun Lamps

WHEN a great department store, such as the Emporium, of San Francisco, devotes a valuable portion of its main floor space to an electrical sun room, that is news. Naturally, to support such a move there was a coincident advertising and promotional effort which made the public of San Francisco pretty well aware that there was something to electric sunshine after all.

Like many other merchants who have only considered the sun lamp as a merchandise item, the Emporium had previously carried sun lamps in its sporting goods department on the main floor toward the rear of the store. No special display or demonstration was staged and the sale of these lamps each year was negligible.

When the sun lamp had been dramatized by a display space and demonstration room of its own in the center of things, the sale increased to ten times as much during the two months of the display as the yearly sale had been previously. This was despite the fact that the display only opened Jan. 21 when much of the season for selling such lamps had already passed.

The display was held in conjunction with the General Electric Co. and was named by the Emporium the "G. E. sun room." In support of the display three four-column, 12-in. advertisements were run in each of the San Francisco papers. Following this were a number of smaller spaces and, finally, a number of 1 column x 10-in. spaces. Besides this, in the radio time used by the Emporium over station KPO, a definite announcement and selling message was given. Supporting this advertising was a window display in two windows on Market St. and displays of sun lamps throughout the store in such places as the baby and nursery departments, etc. Twenty thousand folders for wrappers in the sports department and in the nursery and baby departments were used whenever a bundle was wrapped for those departments. A letter was sent to doctors, nurses, hospitals, etc. announcing the rental service of these lamps to their patients. In addition to this, the Emporium's own magazine sent to its accounts, "Smart Woman," devoted a page to sun lamps.

In the display room, a 10 x 25-ft. space with a ceiling from which hung three of the ceiling-type lamps, a number of easy chairs were placed and sun lamps beside them. The public was invited in the advertising to come in and have a free sun bath. Employees of the store were also invited by a series of bulletins to take advantage of this feature and many of them did throughout the day. This provided a number of people on demonstration in the sun room at all times. This in itself was a good advertising feature.

Focus of attention on the main floor of the Emporium, San Francisco department store, was this dramatically presented sun room which increased yearly sales to ten times those previously recorded.

A young woman in shorts and herself wearing a fine coat of tan was in attendance at the cottage all the time as the demonstrator. Stephen H. Winter, of General Electric Co., also assisted in the demonstrations, acting as a consultant for anyone who wished more technical information regarding the value of the sun rays. Employee interest was further stimulated by a contest in which a sun lamp was given away free. Employees were urged to invite their friends and any prospects to the department for a demonstration of the sun lamps.

Selling was done only on the basis of sunshine and what it would do, with no medical claims made whatever. By this means a fine cooperation was had with the physicians of the city.

The display idea was the result of conferences between Clare Kemp, manager of the sporting goods department, Mr. Ramage, a department manager and Mr. Tropman, advertising manager, of the Emporium, all of whom were enthusiastic over the results obtained, and J. J. Burns, G-E appliance specialist.

A rental arrangement was made available whereby an initial charge of $10 per month was made. It could be applied on the purchase of a sun lamp. The initial payment was made large in order to insure the use of the sun lamp and thereby bring the customer into a realization of its benefits to him.

The list of the first purchasers brings out many interesting sidelights. The first one was sold to a colored woman. One was sold to an infant shelter. A prominent orchestra leader bought another, immediately after the radio broadcast on which he had heard the announcement. Baby specialists referred mothers to the Emporium and one very prominent specialist gave as the alternative to the purchase of a sun lamp the sending of her child to Palm Springs.

Just about this time publicity attendant to the Dionne quintuplets was being featured in the newspapers and they were being shown given sun baths with a sun lamp. The alert advertising manager immediately seized upon this and dramatized it in one of the Emporium's large advertisements.

By thus featuring the sun lamps in a dramatic fashion sales for this dealer increased many times. To the utility it also meant that each of the homes purchasing one of these lamps had added an average of 85 kw.-hr. per year to the load.

Reports on Sales Activities of TVA

Six probable effects of the government's Tennessee Valley Authority project are pointed out in the report of a personal survey made by a number of its editors and just published by McCall's Magazine. Lowered electricity rates; lower prices in certain classes of household electrical appliances; easier terms of payment for appliances; an increased market for all consumer goods in the Tennessee Valley; greater nationwide interest in home elctrification and the need for aggressive promotion of appliance sales by the electrical industry are all indicated in the McCall report.

Pointing out the significance, both to the South and the country as a whole, of the Tennessee Valley Authority project, the survey explains the purpose and make-up of the TVA and its subsidiary, the Electric Home and Farm Authority. Each of the four steps in the TVA "Electricity for All" program are described. Although three of the steps —cheaper current, lowered priced appliances, and sales on easy terms—are dealt with adequately, the McCall TVA report stressed especially the education and promotion phases of the program. The editors are convinced that the comprehensive plan of the TVA and its associates for consumer education and home electrification promotion are the features of the program that most deserve attention by the electrical appliance industry.

The work of the TVA and EHFA in Chattanooga is fully described, as are the results in Tupelo, the first community to take on TVA electricity. How one privately owned utility has tied in its sales promotion work with the TVA program is covered in the survey's section on Atlanta. The importance of the new community of Norris, as an ideal laboratory for all interested in home appliances, is also stressed. Following a chapter on the inescapable conclusions of the TVA experiment, a directory of "who's who" in the TVA is printed in the McCall report, together with a TVA bibliography.

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Distributor Appoints Home Counselor

An extensive home economics program, said to be the first of its kind to be inaugurated in the Northwest by an electrical wholesale company, has been announced by the North Coast Electric Co. of Seattle and Tacoma, Wash., and Portland, Ore. Helen Kerr, lecturer, radio broadcaster and author of articles on home economics, has been appointed to direct a year round campaign.

• CHRYSLER MOTORS have launched into the low price unit air conditioning field with a room-type air conditioning unit to sell at $75 now in production. The unit claims to perform all functions of air conditioning in both winter and summer when connected to a refrigeration and heating source. Sales will be made under the company name of Airtemp, Inc. This new unit is designed to be used in installations where a number of rooms or offices are desired to be conditioned from a central plant. The company will also manufacture self-contained units and large installations for hotels and commercial establishments.

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Verne M. Miller, vice-president, in charge of the Portland office, says that the activities planned for the Washington and Oregon areas will be representative of the newest ideas in the merchandizing business. It will be strictly for the benefits of those using Norge merchandise, North Coast being exclusive distributor for that line. Unusual schools of cooking, interior decorating, budgeting and other forms of home making will be the highlights of the program.

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• A TESTIMONIAL broadside together with a letter to the women of Alameda launched the spring range and water heater sales effort of the Municipal Light and Power Department of Alameda in March. With the attention-getting title "Seven Alameda Women You Know—Tell Why They Cook With Electricity" and with pictures of women of the city busy at various occupations because of the freedom given them from kitchen drudgery by the electric range, made this a very strong sales appeal. Featured are the L & H and Monarch ranges and Wesix water heaters. There is a $25 allowance for old ranges and a free wiring offer of up to $25 on intallation cost. An oven set, terms of 10 per cent down and two years to pay, or under National Housing Act provisions nothing down and three years to pay, offer other inducements to Alameda women in electric cookery and should stimulate many sales, according to H. A. Lewicki, of the department.

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• BUFORD'S, "the Electric Department Store," of Fresno, advertises a special which has been found to bring considerable trade to the store. Once or twice a year a sale of new wringer rolls at $1 each is announced. Not only does this give them a line on owners of old washers that can be sent circulars and interviewed to buy new machines, but it also makes contacts which can be developed for sales of other appliances, such as ironers and refrigerators.

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Cooking School Display

Electrical Equipment Co., of Phoenix, made good use of the opportunity afforded it by the cooking school held by the Arizona Republican. The school was held in a large auditorium and was packed every day with women eager to learn the advantages of modern appliances

Air Conditioning Features New Belsey Building

AS part of its expansion program for 1935 the George Belsey Co., General Electric distributors in southern California, has opened a number of new district stores that will operate under a new retail selling plan in a new Los Angeles headquarters, the Belsey Building, 1001 South Hope St.

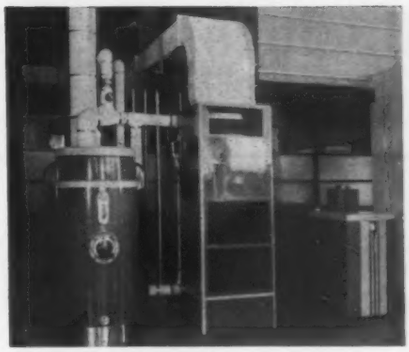
In one building, devoted entirely to its business, the Belsey Co. has centralized its main offices, its engineering department, commercial refrigeration department, air conditioning department, delivery department and an attractive down-town display room. The building was completely renovated before its occupancy. A General Electric air conditioning system was installed, using the oil furnace and a air conditioner which circulates the air, washes it and maintains the correct humidity.

The air conditioning plant, significantly, is located on the display floor —an impressive fact in itself, for thus it is evidence of the compactness and cleanliness of the system.

The display room contains models of all of the products the company now sells, which include the General Electric refrigerators, ranges, dishwashers, washing machines, ironers, vacuum cleaners, water heaters and the home work shop. This display was made complete so that salesmen and district managers in the various district stores can send their prospects into Los Angeles when they can not show the model desired because of a limited floor stock. This plan has resulted in a very heavy selling activity on the display floor of the new headquarters and arrangements have been made so that salesmen feel free to send their prospects in and feel that they will be protected for the work that they have already put in on these prospects.

Also located on this display floor is a complete General Electric kitchen—fully equipped for actual demonstration — two of which are conducted each week by our Home Economist, Bess Meal. These demonstrations, incidentally, are not a cooking school. They are demonstrations to an individual group of prospects.

Now known as the Belsey Building, is this distributors' new headquarters in Los Angeles



Unusual idea and good salesmanship are combined in a model installation of air-conditioning equipment right on the sales floor, which keeps the building air-conditioned as part of its job

DEALER SALES REPORTS—JANUARY-FEBRUARY, 1935

A Summary of the Dealer Reports Compiled by Associations, Societies or Bureaus, or Dealer Contact Departments of Utilities

APPLIANCE	P. G. & E. Co.[1]		San Diego Cons. G. & E. Co.[2]		San Joaquin Lt. & P. Corp.[3]		So. Calif. Edison Co., Ltd.[4]		Utah Power & Lt. Co.[5]		Wash. Water Power Co.[6]	
	Feb. 1935	Year to date	*Feb. 1935	Jan. 1935	Feb. 1935	Jan. to Feb. 1935	Feb. 1935	Jan. to Feb. 1935	Feb. 1935	Jan. to Feb. 1935	Feb. 1935	Jan. to Feb. 1935
Ranges	78	168	.....	3	125	242	362	668	125	215	19	30
Water Heaters	28	50	.....	2	60	108	262	454	11	11	38	40
Air Heaters—aux.	409	1,385	.....	194	28	28	92	324	30	87	.....	71
Air Heaters, 220 volt	50	121	.....	.....	71	154	.....	.....	.....	.....	.....	.....
Refrigerators	1,081	2,675	.....	110	269	373	1,153	1,930	236	408	168	280
Dishwashers	6	10	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Washers	1,777	4,278	.....	207	305	498	1,877	3,704	558	1,122	276	591
Ironers	448	1,335	.....	48	37	84	277	542	30	51	12	58
Vac. Cleaners	1,609	3,705	.....	107	96	149	672	1,262	417	879	125	395
Radios	5,421	13,692	.....	810	479	920	3,488	7,603	751	1,916	627	1,382
Mixers	331	428	.....	47	40	97	251	548	331	509	60	171
Cookers & Caseroles	.....	.....	.....	12	16	28	13	53	1	9	144	278
Irons	.....	.....	.....	168	291	514	1,091	2,155	621	1,337	253	606
Waffle Irons	.....	.....	.....	146	118	248	328	753	168	440	174	309
Toasters	.....	.....	.....	189	133	257	421	957	336	723	371	726
Table Stoves, Grills, etc.	.....	.....	.....	33	103	217	218	439	361	940	.....	.....
Heating Pads	.....	.....	.....	89	.....	.....	223	535	182	384	65	160
Curling Irons	.....	.....	.....	.....	.....	.....	70	131	242	403	.....	.....
Percolators & Coffee Makers	.....	.....	.....	121	93	198	292	585	132	268	241	521
Sewing Machines	1,150	2,368	.....	14	.....	.....	.....	.....	.....	.....	44	80
Clocks	.....	.....	.....	.....	103	190	346	710	185	342	174	365
Fans	.....	.....	.....	.....	.....	.....	13	28	6	13	6	14
Floor Polishers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sun Lamps	.....	.....	.....	.....	3	9	28	58	16	24	8	12
Portable Lamps, Reflectors	.....	.....	.....	.....	94	180	.....	.....	1,601	2,765	235	586
Misc. Lamps, Pin-up, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	785	843	1,722
Yard Lights	.....	.....	.....	.....	34	72	.....	.....	.....	.....	.....	.....
Misc. Small Appl.	.....	.....	.....	215	189	243	369	680	51	51	.....	.....
Total Dealers	1,400	.....	.....	100	.....	.....	572	572	.....	.....	.....	.....
No. reporting	900	.....	.....	75	118	100†	485	483†	243	248†	.....	.....

* February Report was not available at time of going to press. † Arithmetical average number of dealers reporting.

[1] P. G. and E. reports obtained only on major appliances upon which accurate reports are available from dealers' accounts. Total dealers include gas as well as electric dealers. First report of year 1935 starts with Dec., 1934 and will be cumulative from that month.

[2] Gathered by Bureau of Radio and Electric Appliances of San Diego County. Clocks, fans included under miscellaneous.

[3] Includes dealer reports from Midland Counties Public Service Corp. territory also. Compiled by Valley Electrical Supply Co.

[4] Includes reports from dealers on San Joaquin Valley system of the company as well as Southern California areas served. Comparative figures of same month last year indicates improvement.

[5] Includes Utah Power & Light Co. territory in Utah, Idaho and Wyoming. Also Western Colorado Power Co. territory.

[6] Dealer sales only for Spokane and company's territory. Company sales not included. Table stoves, grills included with cookers.

Business Building Brainstorms + + +

[*What the Industry needs is a brainstorm to destroy the power surplus pest—Arthur Markwart, president, P.C.E.A.*]

Prizes Awarded—Contest Continues

ELECTRICAL WEST'S "Business Building Brainstorm" contest will be continued for another six months on the same basis as the preceding six months. This announcement is made coincidental with the naming of winners of the three prizes set up by the Pacific Coast Electrical Association for the best idea for disposing of some of the industry's surplus power.

Great difficulty was experienced by the judges in selecting the winners and the margin was close, particularly in the case of the three finally selected. Here are the final results:

First prize of $25 goes to F. V. Gillum, Southern California Edison Co., Pomona, Calif., for his suggestion, "'Plug In' on the Consumer's Ideas," published in the March issue. In it Mr. Gillum proposes that the industry secure and utilize suggestions from the consumers themselves on how to use more electricity. His plan incorporates a method of reimbursing the consumer for acceptable ideas which is highly novel and practicable.

Second prize of $15 was awarded to J. E. Barrett, district manager, San Joaquin Light & Power Corp., Madera, Calif., for his "brainstorm" for increasing the use of power in agriculture by encouraging winter irrigation in those sections where such a plan is practical and desirable (E. West, January, 1935, page 26). Mr. Barrett indicated how such a plan would definitely benefit the farmer as well as the industry.

Third prize of $10 goes to George W. Turner, commercial agent, Pacific Power & Light Co., Arlington, Ore., for his suggestion for "An Electric-Steam Boiler for Garages" (E. West, January, 1935, page 27). This "brainstorm" appealed to the judges because every garage which has a wash rack requires live steam and it was felt that with practical equipment, an off-peak rate could be offered which would develop a large outlet for kilowatt-hours.

Several contributions won honorable mention from the judges. These included "Movie 'Bank Night' Idea Might Sell Lighting", submitted by E. M. McLaughlin, electrical inspector, Richmond, Calif.; "Wiring Which Will Increase Range Sales", by Vernon E. Leech, Southern California Edison Co., Pasadena, and "Plan for Financing Highway Lighting", by Karl Koch, General Electric Co., San Francisco.

The contest was judged by A. H. Markwart, president; R. R. Cowles, chairman, Engineering Economics Section, and H. M. Crawford, chairman, Business Development Section, P. C. E. A., together with George C. Tenney, editor of *Electrical West*.

Suggestions which have been received but which have not yet been published will be entered in the second half of the contest for which the same rules and same prizes will apply.

●

An Old Prescription For a New Malady

MRS. UTILITY: "Oh mercy me, don't tell me the doctor isn't in."

NURSE: "Be seated, Mrs. Utility. Doctor Service will see you in just a few moments. Nothing serious, I hope."

MRS. UTILITY: "Nothing serious! How in the world can you ask that? Can't you see that I am ill?"

NURSE: "Oh, I am very well but I am certain Doctor Service will have you feeling your normal self in a short time. There's his bell now. Right this way please. Doctor, Mrs. Utility."

DR. SERVICE: "Yes, come right in."

MRS. UTILITY: "Oh, doctor, I am certainly glad to find you in. I have been suffering something terrible. In fact, I have been failing for several years and I have taken just oceans of appliance sales but I don't seem to improve. Instead I am gradually getting worse. Oh, doctor, isn't there something you can do?"

DR. SERVICE: "With your cooperation I am sure we can effect a cure. Please describe your symptoms and give me a brief history of your case."

MRS. UTILITY: "It's my shrunken *revenuex*. Really it's an old malady, I believe everyone is affected with it at times. Of late it is getting more serious, aggravated, no doubt, by unfavorable *publix opinyix*. The attacks are usually preceded by a state of lethargy, a sort of laxity or don't care feeling. One just lets things sort of ride along. Then, when these attacks of shrunken *revenuex* grip you, you enter into a state of bewilderment and, like a drowning man, snatch at every straw. The worst point is that you are so bewildered you can't remember what business you are engaged in and are apt to meddle in other people's lines. It's so bad, doctor, that I can't remember the name of an old remedy we used to use with such wonderful results for this ailment. Of late I have been taking appliance sales in the form of campaign drives. Although they give me a small measure of relief I am beginning to think that my system isn't adjusted to handle them. So I decided to see you and ask your professional advice and let those who have a system equipped for it take those appliance sales. What would you prescribe, doctor?"

The doctor hands Mrs. Utility a folded prescription blank. "I believe that will entirely cure you of your shrunken *revenuex* and will also do wonders for that unfavorable *publix opinyix*."

Mrs. Utility unfolded the prescription blank and read: R/x Good Service—give freely twenty-four hours a day. "Why, doctor, that's the old remedy we used to use with such wonderful results!"

Contest to Continue

Prizes aggregating $50 will be awarded for the best business building ideas to dispose of the industry's power surplus published in *Electrical West* during the six months, May to October, inclusive. Ideas will be judged by a committee consisting of officers of the P.C.E.A. and the editor. Business-building merit, practicability of application and originality will be the basis of judging and the opinion of the judges will be final in awarding $25 for the best idea submitted, $15 for the next best and $10 for the third best.

In addition *Electrical West* will pay $2.50 for each idea considered worthy of publication by the editors. Suggestions preferably should be limited to 400 words or less, may be published under a nom de plume and should be sent to the editor.

DR. SERVICE: "Just so, just so. If I were you I would frame it and hang it over my desk, just in case."—JACK DARLING.

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Rate Refund Instead of Rate Reductions

20 To the orthodox mind of the rate expert any rate change, resulting in lower unit cost to the customer, is nothing short of a rate reduction. The customer, on the other hand, regardless of how much these reductions are publicized, is prone to consider them solely from the viewpoint of "How much it will reduce my bill?"

Most of the reductions have been accompanied by strenuous sales activities, designed to increase use and incidentally revenue. There is evidence galore that a large host of customers "go along" with these promotional programs; they increase their use of service to such an extent that their bills are increased in spite of rate reductions. Of course that is the objective we strive to attain. At the same time it should be recognized that the customer has not yet learned to appraise the true value of service represented by the bill he received; he sees nothing but the amount of the bill and sometimes it takes no end of time and patience to convince him that there actually has been a reduction. Even then his parting remark is quite apt to be "Well, it's costing too darned much, and I can't see where the reduction has done me any good." He is skeptical because he has no tangible evidence of the benefit derived by the reduction.

Some business concerns operate on a "share the profit" basis with their customers, seldom reducing the base rate or charge, but making annual cost adjustments in the form of cash refunds. Since we are in the midst of a series of "rate stunts" would not it be worth while to investigate a refunding plan which would give to the customer a cash refund in lieu of the regular rate reduction? We can present statistics by the yard, purporting to show the customer how much he has saved by a rate reduction, yet he will not be consoled. A reduction in the form of a cash refund, however, would carry with it a psychology which could be of immense value to the entire industry.

Just notice how graciously the average customer accepts the refund of a service deposit. Wouldn't he accept a cash refund of a portion of his service bill all the more graciously? I think he would.

From a public relations standpoint the proposition would be quite valuable; the customer would have tangible evidence of the amount of his "saving"; the accounting procedure should be no more complicated than that required by the various "inducement offers" now in vogue; and just ask any salesman whether or not such refund checks would be any good as "door openers." —JAY BEE.

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Wiring Which Will Increase Range Sales

21 The present cost of wiring for an electric range is often a deterring factor in the sale of them. Adding this cost to the cost of a range and making an installed price does not help much. We can only expect to compete with other methods of cooking by making some concessions, which indeed, most companies do in one way or another.

The suggestion is therefore made that the utility company install and own all of the equipment necessary to put a range or water heater in service. We already install without charge the required leads from the transformer to the house, as well as the meter. Let us then work out a standard equipment consisting of a main switch with fuses, preferably with the meter mounted integral and of the "tamper-proof" type, and with a branch to carry leads to the present service. This should be placed in a waterproof box, or better, the entire piece of equipment should be weatherproof so it could be mounted outdoors on the side of the house. Outdoor equipment is somewhat more expensive but will be easier and cheaper to install and remove as well as having the meter in a more desirable location.

Then a weatherproof armored cable should be carried down the side of the building, run under the floor and carried through a hole directly to the range or water heater. The armor should be grounded and the stove frame and switch box connected to it. The cable is important, it does not need to be heavily insulated but should be protected from mechanical injury and must, of course, be free from fire hazard, and must also be as cheap as possible, as this will represent most of the cost. The lower 6 ft. on the outside of the building may be further protected by a metal or wooden guard.

It is believed that it will be possible to make up a very simple standard unit of this type at quite reasonable cost. In addition the cost of installation, in most cases, would be so low as to make it possible to serve ranges in rented houses, or even to rent ranges. To prevent waste in moving the unit from one location to another, the cable should not be cut to fit the job but kept in standard lengths, and the surplus taken up under the house. Also injury to the residence must be avoided by proper location of holes and service box; and by closing the holes, when removing the cable, with a special plug or plate. —V.E.L.

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Sell the Hobby Rider A Home Workshop

22 An excellent load builder, largely off-peak, requiring little or no servicing from the utility, and having great possibilities of more kilowatt-hour consumption in the home is the home workshop hobby. These home workshops are installed in garages, basements, spare rooms, or where space is available for the type of machinery needed.

The average man will first purchase a wood turning lathe having accessories for metal turning or metal spinning. Previous experience or skill need not deter the novice from doing expert work, and then gaining confidence and proficiency in this work, his enthusiasm increases, thus creating a desire to equip his shop with more machinery such as a circular and band saw, a scroll saw, a drill press with wood working attachments, sanding machines, paint sprayers and so on down the line, the amount of equipment installed being governed by available space and finances.

Lighting of the shop is a vital point. For general shop lighting to insure accurate work and also as a safety measure, each machine should have its individual light. Shop heating and ventilation should be taken into consideration. The wood worker can find use for the electric glue pot. The metal craftsman will need electric soldering irons, or a spot welder.

This fascinating hobby can be shared by other members of the family, as they may be interested in putting the finishing touches on the various projects made in the workshop. Furniture can be carved, inlayed, stained or painted. Novelties, gifts, and toys all come in for a variety of finishes.

An unfinished attic, basement, or a large room has great possibilities for a den or family recreation room. This room can be furnished and finished by the craftsman with the aid of his home workshop, and according to the desires and creative instincts of other members of the family.

Certain it is that while the craftsman is busily engaged evenings in his home workshop, other members of the family will either be helping him, or else they will be in the house using the radio, reading lamps, or other electrical appliances. All of which should be of great benefit to the utility.—H. B. GRAEFF.

Rural Load Building + + +

Ads and Testimonials Sell Electric Pumping

BY reprinting a series of seven advertisements on the advantages of electricity for irrigation, together with testimonial letters from farmers reciting their experience with electric pumps, the San Joaquin Light & Power Corp. has produced an effective sixteen-page booklet for distribution to present and prospective farm customers in its territory.

Each of the advertisements deals specifically with one advantage of electric irrigation. However, each piece of copy repeats all six. The advantages discussed are: (1) Lowest in cost when all factors are considered; (2) Most dependable—free from costly delays; (3) Lowest in upkeep—more efficient and durable; (4) easiest to operate—no manual labor required; (5) requires no attention—no time or labor wasted; and (6) available instantly—just throw the switch.

Typical of the testimonial letters is the following:

"It is unquestionably easier to operate an electric motor than any other kind of power for pumping, and the cost of upkeep is lower on the motor also. I have a 7½-hp. motor on a 3½-in. pump for irrigating my 32-acre place on which I raise feed for my hogs, dairy cattle and chickens. I put in my motor in April, 1934.

"Before that I was using a small automobile engine. While I did not have any major breakdown with the engine, still, I had to replace spark plugs, timer and coil points frequently. That runs into money.

"Besides, at least every three hours I had to leave my work and come back, sometimes clear across the farm, to put gasoline and oil in the engine, and dressing on the belt. If the engine was balky I'd have to come oftener.

"For five years I used gasoline, and then in trying to economize, I tried out tractor fuel. Then the grief really did begin. I blew out three connecting rods and two main bearings. The low grade fuel didn't burn completely and formed hard carbon which clogged the oil line. That cheap fuel cost me the loss of a third of my six-acre corn crop.

"With the engine I was on a nervous strain day and night. All day I was listening for the engine to miss, and at night I was still listening.

"Since electricity costs no more than gasoline at 12 cents a gallon, and the electric motor requires attention only once or twice a day, I switched from the engine and put in my dependable electric motor."

In addition to the advertisements and the testimonial letters, which incidentally are accompanied by photographs of the writers, the booklet gives data on how agricultural power rates have been reduced since 1921. It also recites the causes of high water costs and offers information for reducing these costs.

Sample of one of the advertisements on electric pumping used by the San Joaquin Light & Power Corp. The signature has been omitted

No. 2 of the Advantages of Electricity for Irrigation

ELECTRIC PUMPING IS MOST DEPENDABLE

Motors Don't Run in "Fits and Starts"

WITH some crops, such as cotton, a delay in irrigation may mean the loss of hundreds of dollars. And to the men who raise those crops, the dependability of electric pumping is its most important advantage.

They know that a motor has only one moving part, as compared with a hundred or more in an engine, so they rate the motor a 100 to 1 choice in dependability. They know, too, that motor repair shops are everywhere and that they can get a rent motor on a moment's notice. With electric pumping, there is seldom a delay of more than half an hour.

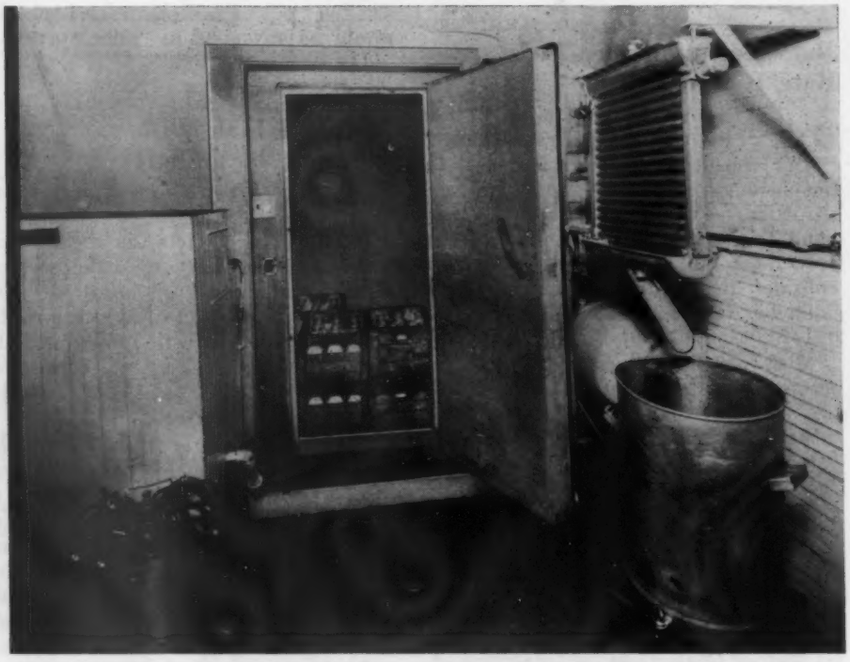
Pump with electricity this season.

Six Advantages of Electric Pumping

1. LOWEST IN COST—when all factors are considered.
2. MOST DEPENDABLE—free from costly delays.
3. LOWEST IN UPKEEP—more efficient and durable.
4. EASIEST TO OPERATE—no manual labor required.
5. REQUIRES NO ATTENTION—no time or labor wasted.
6. AVAILABLE INSTANTLY—just throw the switch.

FREE SERVICE

We offer a free advisory service on any farm pumping problem. Just get in touch with any of our district offices by letter, phone or personal call.



Modern milk house on the Jones Dairy showing milking cooling equipment and new walk-in refrigerator

Profits Increase When Dairy Is Electrified

Modern electrical equipment may mean the difference between profit and loss for the small dairy specializing in the sale and delivery of high grade milk and cream. In the case of Wendall Jones in the Carmichael district in the Sacramento Valley, it has proved highly profitable according to the rural electrification department of the Pacific Gas and Electric Co.

Starting seven years ago with one pure-bred Jersey cow, the Jones dairy now has thirty-five. The dairy plant has been electrified step by step and with the latest addition—a walk-in refrigerator installed for the purpose of keeping milk and cream cool prior to delivery—has become one of the most modern in the territory. Equipment includes an electric milking machine, cooling apparatus, sterilizer and a bottle washer.

Although not electrical, one of the devices developed by Mr. Jones can be adapted to any dairy farm. It consists of an automatic drinking fountain. A cup-shaped container has been fastened by means of a valve to the end of a water pipe. A cow pushes the cup down with her nose and water flows. When she ceases drinking the cup moves upward and the flow of water stops.

Bill Jones Speaks + + +

. . . for an Operations Audit

"HEY BILL, come here," called the manager as Bill Jones strode down the hall past the open door. "At infrequent intervals I don't mind a visit from you—much. You serve as a sort of counter-irritant. While I don't remember that you ever gave me a real idea of any sort, I rather enjoy you because your alleged thoughts orient my mind in a contrary direction."

"Well," said Bill, "one reason we all should love the Lord is because He gives us so many people to laugh at—including ourselves."

"Maybe so, but it is evident that at last the tide is beginning to turn. The Federal courts are swinging into action and are challenging State Socialism, as exemplified by TVA, and I am betting a box of cigars that the Supreme Court will uphold them. So all in all I am feeling pretty good today; although, of course, it is possible your visit will change all of that," grinned the manager.

"The Fourteenth Amendment to the Constitution of the United States *does not* protect your property against *confiscation by public opinion*—Supreme Court or no Supreme Court. You might think that over before you permit yourself to become too kittenish. Did you ever give any thought to 'an Operations Audit'?"

"Never heard of such a thing. Did you?"

"No," admitted Bill, "at least not by that name. However, the background is something like this: In the infantile days of your industry, its toddling steps were solicitously guided by the banker and the lawyer, and in that formative period they were about all of the guardianhip you needed. In the person of the town's banker was presumably concentrated all of the wisdom which hadn't been appropriated by the leading firm of attorneys. Both of these gentlemen were on your Board of Directors, and together, dominated the company and its affairs. From time immemorial the banker has been a shining and outstanding example of such groups as know the least of some of the things of which they should know the most.

"When your forebears got into any trouble, they immediately ran to the lawyer, and he, having learned by long experience that when the human animal does anything, it is customarily and usually wrong, very cannily advised them to do nothing. Now where those pioneers ever got the idea that a lawyer necessarily knew anything about the utility business, or of the delicacies and intricacies of public relations, is still an unsolved mystery.

"Notwithstanding the fact that much water has gone over the dam since the days of Menlo Park, the traditions of that time are still with you. Yet the stage setting has completely changed. I've heard your enemies say that your industry hasn't had a new idea—other than mechanical—for years. You have had ideas, but have you sold them? In a universe of evolution, you have missed some of the biggest opportunities for telling the public what electricity can do for it.

"Your early environment which seemingly you have been unable to leave behind, has resulted in your ideas becoming inbred. From a technical standpoint, you are one of the marvels of the earth; but human relations don't lend themselves to slide rules and logarithms. You are living and working in a world of constant changes, improved and better business practices. To survive all of us must keep pace. Other industries, starting years behind you, are now years ahead of you. Your horizon has been obscured by prohibitions and inhibitions.

"The problems growing out of the depression, the attacks of the political fakers, should have stimulated you to an effort that would have placed you in the lead. Intead you have literally turned the other cheek. All in all, you haven't shown much fight — considering your opportunities and your obligations to a rapidly moving civilization.

"When a really constructive thought comes along the specter of that age of the banker and the lawyer shouts in your ear, 'It can't be done'; 'We mustn't do that;' 'That isn't the logical way,' etc.

"If throughout our existence on earth we had limited our efforts to the logical, and to the known possibilities and probabilities, the human race—what there was of it—would still be huddled around the crest of Mt. Ararat, waiting for more favorable conditions before adventuring to seek the unattainable. To recall Josh Billings, 'You know too many things which aren't so.'

"A very large number of people—your fellow citizens and neighbors—in this land of ours are wondering if they should continue to buy such a vital service as electric light and power from you, or whether they should take it over themselves. What has your industry done in the past two years—or for ten years—to convince them that it is better fitted for performance of that job than are they?

"It is time to snap out of it, kick the 'Stop' signs of the past into the garbage can, and bolt the 'GO' sign on every door, and above all, burn it into your brain. Things don't just happen—ever. We are fond of saying that no one can possibly tell where or when the little toy balloon will land, and yet, given a sufficient number of appropriate instruments to carefully weigh that balloon, ascertain its leakage, take temperatures of the air at all probable strata, chart air movements, etc., it is possible to tell exactly where that balloon will be one minute, one hour, or one day hence. Every manager is confronted with the choice of humanizing and inspiring his organization, or of depressing it.

"You should consider bringing in some one from the outside, such as a department store man, to help you put your pieces together—a man who knows nothing of your traditions, nor respects them, but does know a lot about human nature, building up good will and public relations with the customer, and is alive with an abundance of unfettered common sense. Of course you will say, 'Nonsense! If I had a toothache, I wouldn't call in a piano tuner.' Still, lots of successful industries do just about that. And it happens to be true that a piano tuner did invent many of the more important instruments of the dental office.

"And so that's the gist of my 'Operations Audit,' to be made by men with no pre-conceived and limiting notions whatever regarding our customs, methods or practices—men who will study over-all problems, and inaugurate salutary changes, as other outside experts have already done for other concerns."

Engineering Symposium + + +

[A monthly forum in which engineers will present and discuss their problems, this department is dedicated to advancing the art of power generation, transmission, distribution and utilization]

Repairing and Maintaining a 6000-Kw. Water-Driven Generator*

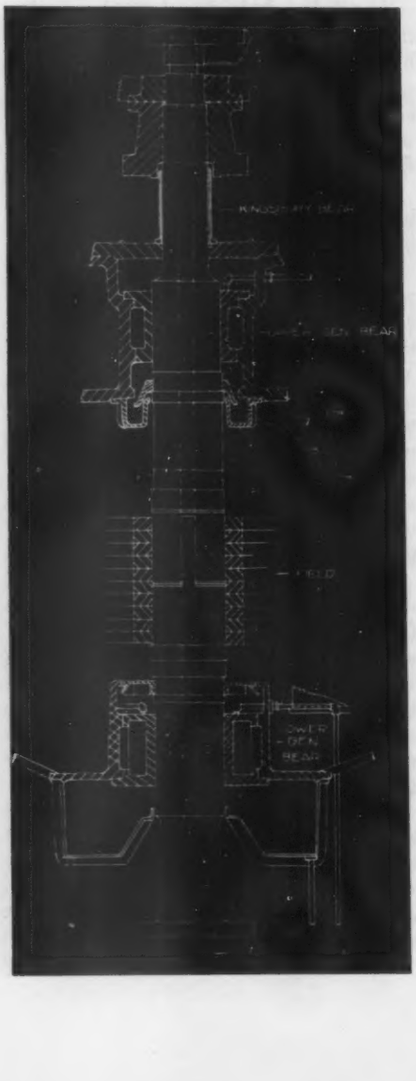
By J. H. SIEGFRIED
Pacific Power & Light Company

THE machine covered by this paper is a 6,000-kw., vertical alternator driven by a 8,700 hp. water wheel operating under a 187-ft. head and running at 360 r.p.m. It was installed at Hood River and began operating on May 10, 1923. The water wheel shaft and generator shaft are separate and are connected together by a flanged coupling. The water wheel is imbedded in the concrete foundation and the generator is supported by a spacing ring between the two. Between the coupling and the water wheel there is a steady bearing 12-in. x 22-in., the shaft being 12 in. in diameter. The generator has a spider above and below the rotating field and these spiders support steady bearings 14 in. in diameter and 14 in. long. Above the top steady bearing is located a 25-in. Kingsbury thrust bearing, the weight being carried on six shoes. The bearing area per shoe is 56.7 sq. in. while the total area is 340 sq. in. This bearing carries the entire weight of the revolving part of the unit and the thrust due to the water, a total maximum of 55,000 lb.

This particular bearing has six cast iron shoes faced with babbitt. Each shoe rests on a jackscrew which can be adjusted for height so that each individual shoe takes its own portion of the load. A locking device is provided to prevent the jackscrews from turning and changing the adjustment. Above the shoes is located a cast-iron runner plate which is highly polished on the lower side. This runner plate revolves with the shaft, the shoes remaining stationary. The runner plate is drilled for six 1-in. dowel pins which fit into the thrust collar. This collar consists of a bell-shaped steel sleeve keyed to the shaft and held in place by a steel lifting nut which also furnishes a means for lifting the revolving element with a crane. The upper end of the generator shaft, which extends beyond the lifting nut, is tapered and carries the exciter armature and shaft.

The Kingsbury bearing housing is filled with oil to a height which keeps the runner plate and shoes submerged at all times. This housing also supports the exciter field and frame. A 3-in. hole runs through the entire length of the generator and exciter shafts. At the top of the revolving field a hole is cut in the generator shaft and the field leads are carried through it and through the exciter shaft to the collector rings at the top of the unit.

Fig. 1—Cross-section of shaft assembly of the water-driven generator



The rotor lacks 1 in. of being 9 ft. in diameter. It is 25 in. thick, being built up of ten discs of steel 2½ in. thick. These are held together by tie rods 1½ in. in diameter. Five 12-in. holes are spaced equally around the shaft on a 33-in. circle. Five of the tie rods are located midway between the large holes and 12½ in. from the center of the rotor. Ten more rods of the same dimensions are spaced around the shaft and 20 in. from the center while 20 additional rods are placed near the periphery and half way between the pole pieces. The generator shaft weighs 6,400 lb. while the rotor alone weighs 23 tons.

The exciter is mounted on the top of the generator, the lower end of the exciter shaft fitting over a taper on the upper end of the generator shaft. The exciter has no bearing other than a ball, steady bearing above the commutator and just below the collector rings. The exciter shaft carries a key which fits in a keyway in the generator shaft. There is no flange coupling of any description between the two.

On May 23, 1934 the exciter shaft slipped down on the generator shaft so that the ball bearing collar on the exciter shaft came in contact with the ball bearing housing. On dismantling the exciter, it was found that the exciter shaft had wobbled causing wear between the generator and exciter shafts. Preparations were made to set up a turning rig above the Kingsbury housing and turn the taper end of the shaft by running the unit with water, but when an attempt was made to do this it was found

*A report prepared for Production and Generation Committee, Engineering and Operation Section, Northwest Electric Light & Power Association, for presentation at 1935 Annual Section Meeting.

impossible because the top of the shaft wobbled. This action pointed to a worn generator upper steady bearing and lead to dismantling the Kingsbury bearing to determine the cause. Before the thrust collar was removed, it was found possible to pass a feeler gauge 6 in. long and .004 in. thick between the shaft and the thrust collar on one side of the shaft. When the collar was removed, a triangular bright spot was seen on the shaft where the thrust collar did not make contact with the side of the shaft. An examination of the thrust collar showed that it was not completely round but was rough in some spots in the bore and that the lower face, which comes in contact with the runner plate, was rough and had some bad spots in it. The runner plate itself was worn due to movement between the runner plate and the thrust collar. This wear on the back of the runner plate amounted to .008 in. One shoe of the bearing had not made contact due to faulty adjustment of the shoe. All parts of the Kingsbury bearing were removed and a check showed that there was very little wear in the upper steady bearing.

When the exciter shaft was removed a large quantity of red iron oxide was found between the two pieces of shafting and during the process of drawing the thrust collar from the shaft, penetrating oil was used freely so that after the thrust collar had been removed, the shaft was still covered with a paste of penetrating oil and red iron oxide. Inspection of the shaft, which was tapered .005 in. per inch of length at the place where the thrust collar rested, indicated that the metal had been eaten away, and on careful check it was found that at a point 5½ in. from the bottom of the shoulder where the thrust collar rested, the diameter of the shaft had been reduced by .024 in. Since all the weight of the revolving part of the machine is taken by the thrust bearing, it was impossible to make repairs by welding on the job as there would be no way to support the revolving element while the work was being done. The only thing to be done was to uncouple the generator from the water wheel and press the shaft from the rotor. The shaft at the rotor seat was approximately 15 in. in diameter.

The local representatives of the manufacturer of this unit advised that it would require from 150 to 185 tons to press the shaft from the rotor and a pulling rig was made up to do this. This rig consisted of five 2½ in. steel rods threaded at both top and bottom with "V" threads, eight to the inch. For the bottom of the rods, steel nuts were provided 5 in. long and with only two flat parallel faces. The nuts for the upper ends of the rods were of the same material but were hexagonal. A strongback was built consisting of a steel plate 30 in. in diameter and 1½ in. thick. On the top of this plate were welded 5 steel bars 4½ in. high and 1½ in. thick and arranged to form a pentagon. Five other steel bars of the same height but only 1 in. in thickness were placed inside and parallel to the five thicker bars. At the vertices, a hole was drilled large enough to accommodate the 2½ in. rods and directly above and on top of the bars were placed smooth steel washers on which the pulling nuts would turn. A "hex" wrench with a 3-ft. handle, 2½ in. thick was provided to turn the nuts. Five 12-in. square steel plates 1½ in. thick to be used for washers across the 12-in. holes at the bottom of the rotor were made up at Portland and shipped to Hood River.

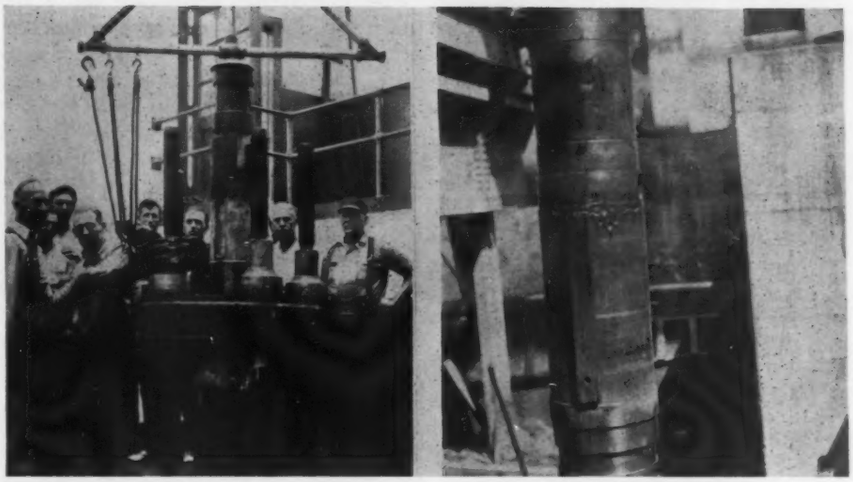


Fig. 2—Second set-up for pressing shaft from the rotor. Note arrangement for raising heavy wrench above the end of the pull rods when moving from one to the other. (Right)—Shaft after removed from the rotor the second time showing the damage caused by the projecting lamination

Reports No. 2 and 3 of the Northwest Electric Light & Power Association Engineering Section.

The rig was set up and an attempt was made to move the shaft by placing the strong back on the thrust collar, which was put in place on the shaft. The rods extended through the strong back and 12-in. holes in the rotor and through the plates below the rotor. The nuts were turned up by hand as far as possible after which, one man tightened all nuts by means of the wrench. On account of having an odd number of holes in the rotor, an even pull could not be made around the shaft so that the rods were numbered consecutively and the order of tightening was 1-3-5-2-4. After the nuts were tightened as much as possible by means of the wrench, a long pipe was slipped over the wrench handle and the men pushed it around. After a heavy strain was put on the rods it was noticed that the stop shoulder on the shaft had not moved away from the bottom of the rotor although the thrust collar had moved appreciably. A careful check and examination showed that the thrust collar, which had been in contact with a shoulder ⅛ in. wide around the 9¼ in. section of shaft was moving the shoulder and bulging the shaft. The increase in diameter ¾ in. below the shoulder was 3/32 in. It was found also that the steel plates under the rotor were bending and a new set up had to be made.

The shaft below the thrust collar is 9¼ in. in diameter for a distance of about 23 in. where the diameter increases to 14 in. and serves as a journal for the generator upper steady bearing. The shop at Portland located an old engine crank from a marine engine. This was burned approximately circular after which it was put in the lathe and a cut taken on the outside to true it up. A template of the curve in the shaft at the shoulder was made and this steel ring was turned to the template so it would fit on the shaft. The ring was 23 in. in diameter and 7⅜ in. thick and was bored out 9 5/16 in. Five new steel plates 1½ in. thick were burned out to fit between the nuts on the tie rods and allow the plates to overlap the 12-in. holes by at least 1½ in.

This material was shipped to Hood River and the steel ring was fitted to the shoulder on the shaft by bluing the shaft and filing the high spots from the ring

until it made contact on the shoulder on a surface ¾ in. wide. To protect the shaft from injury sheets of copper 1/32 in. thick were placed between the ring and shoulder and the set up made as before, the difference being that there were two washers over the 12-in. holes below the rotor. The shaft was made up of steel of low carbon content and was quite soft. After this shaft was subjected to heavy pressures at the shoulder it was found that the copper strips had been pressed into the steel shaft.

It was thought that there might be an advantage in heating the rotor and a heater was made consisting of five ¾-in. pipes 28 in. long with a row of ⅛-in. holes bored on one side. These five pipes were capped on the lower end and connected together by piping so that there would be a burner in each one of the five large holes in the rotor. In the middle of this piping arrangement was placed a 1¼-in. tee, in the side opening of which was screwed a 1¼-in. pipe 4 ft. long. At the end of this, another tee was screwed on and the end of the tee was plugged with a reducer threaded so a ¼-in. pipe could be screwed on the inside of the reducer as well as on the outside. A line from the compressed air tank was connected to this through a valve. On the side of the 1¼-in. tee was connected a line from a gas tank, the flow of gas being controlled by a valve near the tee. The 4-ft. pipe was used as a mixing chamber and an excellent heating arrangement resulted.

After the pulling rig was assembled the rotor was heated and a heavy strain put on the rods. The shaft at the rotor was as hot as the hand could stand. At this time it required 35 blows with a 12-lb. hammer on a 3-ft. wrench to turn the nuts 1/16 of a turn but with this strain no movement of the shaft could be detected. The next day the rotor was again heated and while the tightening process was going on the shaft was filled with dry ice in an attempt to shrink it. The rods and rotor were quite hot and after the effects of the dry ice had passed off a stream of cold water was kept running through the shaft to cool it. While the men were at dinner the shaft suddenly slipped about ⅛ in. This was due to the fact that the additional strain due to cooling the rods added to the initial strain put on by the nuts, was sufficient to start the shaft moving. It required two more days to move the shaft completely out of the rotor.

The shaft was sent to the shop, together with the thrust collar, lifting nut and runner plate. The shaft was placed in a lathe, checked and found to be straight. It was then built up at the thrust collar seat and on the taper at the top of the shaft by welding. While the shaft was cooling the thrust collar was bored out true. The shaft was then placed in the lathe and the seat for the thrust collar turned to fit the new bore of the collar. This was slipped on the shaft while cold and a cut was taken across both the top and bottom of the collar to make these faces at right angles to the axis of the shaft. The tapered end of the shaft was then turned to the dimensions shown by the manufacturer's drawing.

When the pulling rig was dismantled it was found that some of the 2½ in. rods had stretched changing the pitch of the threads and making it impossible to turn the nuts. It was also found that all rods were not of the same material and some stretched more than the others. Considerable time was lost on the job on account of these rods stretching. Five new rode 2¾ in. in diameter of SAE 1,040 steel tensile strength 90,000 lb. to the square inch were ordered. At both ends of these rods Acme threads, 4 to the inch, were cut. On the bottom were fitted steel nuts 5 in. long with only two flat parallel faces, and for the top, brass nuts were cast 10 in. long with flanges at the bottom 8 in. in diameter and 1 in. thick. The material from which these nuts were cast was made up of the ends of condenser tubes cut off while retubing a steamship condenser.

For washers between the nuts and the top of the rotor, the same 1½-in. plates over the 12 in. holes in the rotor were used. On top of these were placed five cast iron spools 12 in. high and 8 in. in diameter, machined both top and bottom to make the ends parallel. Above the cast iron spool was placed a steel washer 8 in. in diameter with the upper side polished. Between this washer and the nut was placed a second steel washer 8 in. in diameter with both top and bottom faces polished and each face grooved for grease, these grooves being connected with Alemite fittings on the outer side of the steel washer. The brass nuts were also equipped with Alemite grease fittings. A steel plate 25 in. in diameter and ¾ in. thick and machined true on one side was placed under the finished surface of the coupling flange to protect it. Below this plate the strongback was placed. A keeper made of ½ in. sheet iron fastened to the strongback was furnished to prevent the lower nuts from turning.

The shaft, with other parts and material, were returned to the powerhouse and the set up made for pulling the shaft in place in the rotor. The bore of the rotor was carefully cleaned and polished as was the shaft at the rotor seat. The rods and washers were thoroughly greased after which the shaft was centered and raised in the bore until the friction was sufficient to lift the 23-ton rotor from the blocking. The rotor was bored one-half its length 15 in. in diameter and the other half 14⅞ in. This would make it necessary to press the shaft only 12 in.

All precautions were taken to prevent injury to the threads on the rods, to prevent dirt from getting between the shaft and rotor, and the journals and other parts of the shaft were protected by wrapping with gunnysacks or sections of 20-in. leather belting.

When the crane could not move the shaft any farther in the rotor, nuts were tightened on the pulling rig—first, by hand and then by one man using the 3-ft. wrench. The shaft appeared to enter the rotor bore easily and we hoped to move it right into place. However, the farther it went the harder became the pulling until finally the stop shoulder on the shaft was 4 in. from the bottom of the rotor. The shaft was left this way during the night and careful measurements the next day showed that the shoulder was ⅛ in. farther away from the rotor than when the work had stopped the night before. This indicated that the shaft was up against something which would spring back when pressure was released.

During this time of pull we attempted to heat the rotor and cool the shaft. We dropped into the 3-in. hole a considerable amount of dry ice and to prevent the carbon dioxide from settling in the repair room, it was piped outside. We also poured 32 liters of liquid oxygen in the shaft, hoping it would shrink the shaft sufficient to move it. At this time the pulling was getting more difficult and several new and heavier wrenches were made. These were cut out of a steel plate 1½ in. thick and the handle was 4 ft. long. At the head of the wrench the cross section of the handle was 1½-in. by 6 in. In order to make this wrench thicker another 1½-in. plate was placed above and below the head and welded in place, after which a hexagonal hole to fit the nuts was machined in the wrench.

At the time the liquid oxygen was added to the shaft, two of these wrenches were being used and were being driven around by means of 30-lb. sledge hammers. Three loops of 1-in. rope, the loops being about 8 ft. long, were put around the handle of the wrench; a piece of 20-in. 2-ply leather belting put in the rope slings; and three men stood with their backs against the leather belting and kept the wrench tight against

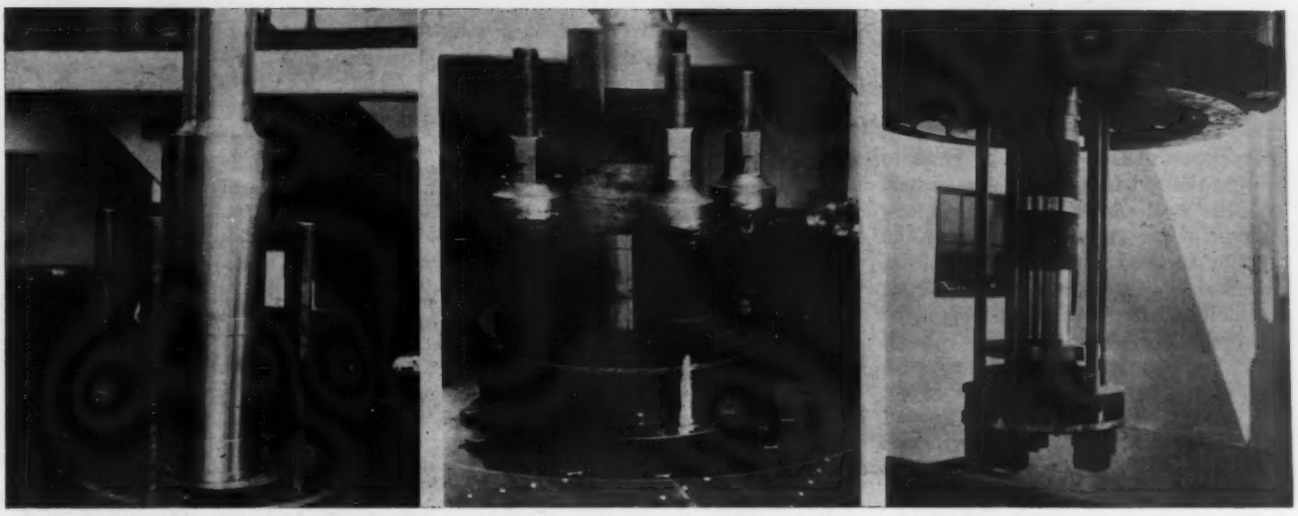


Fig. 3 (left)—Arrangement of rods and rings for pressing shaft in rotor. (Center)—Second complete setup for pressing shaft into rotor. (Right)—Arrangement below the rotor when the shaft was finally being pressed into place

the nut while the driving process took place. Shortly after the liquid oxygen was used both heavy wrenches were broken off at the head. At this time it required 87 blows with a 30-lb. sledge hammer on the end of the 4-ft. wrench to move the nuts ⅛ of a turn. The failure of the wrenches held up the job and it was impossible to state definitely whether the addition of the liquid oxygen was of any help whatsoever. The brass nuts showed signs of failure and when the shaft had 4 in. to go the flanges on the nuts split and it was found that the inner part of the nuts was not making contact with the rods for a distance of 2½ in. from the bottom.

At this stage it was decided to use hydraulic jacks. A number of these with capacities varying from 200 to 60 tons were located in Portland and sent to a shop to be overhauled and checked and to be put in first class condition before being sent to the powerhouse. Another strongback was designed to be used above the rotor. This consisted of two plates of steel 1½ in. thick and separated by two concentric rings of steel 1½ in. thick and 6 in. high. The rings and plates were welded together and holes burned in the plates to accommodate the screws. The jacks were set up on the top of the rotor and worked against the bottom of the new strongback. The next 48 hours were spent in overcoming difficulties with the jacks. After the first few hours we found it necessary to take down the entire jack equipment and send it back to Portland to be put in operating condition. When it was returned we again made the set up, using five jacks, but experienced a great deal of trouble with the equipment. The jacks were connected to the pumps by means of ⅝ in. copper tubing with a small bore. When a heavy pressure was developed by the pump, these copper tubes ruptured, releasing the strain on one side of the shaft and throwing heavy side strains on the opposite side. The entire jack equipment was then thrown out.

A telegram was sent to the manufacturer requesting information on the method used at the shop for assembling the parts, what pressures were required, whether the rotor was heated, etc. and told of our experiences to date. The reply received gave the necessary information but also stated that from the description of our experiences it was evident that the shaft had fouled on one of the laminations in the rotor and advised that the shaft be removed for examination.

Preparations were made for doing this and the second strongback was placed on the ring which was fitted to the shoulder above the upper journal. The brass nuts were replaced by steel ones. The shaft was pressed down the proper distance but it did not drop out of the bore of the rotor so jacks were placed between the flange on the shaft and the bottom of the rotor and the shaft finally pressed out. It was found that the shoulder on the shaft had fouled on the bottom of the second lamination from the top. The shaft for a few inches was badly scored and the bore of the rotor was also badly scored and grooved. Pieces of steel ¾ in. wide and ¼ to ⅜-in. thick were picked out of the shaft. It was necessary to return the shaft to Portland to have it again built up by welding. The rotor was rebored at the plant by a crew using boring equipment with which engine cylinders on board steamships are trued up while in place.

When the rotor was bored, instructions were given to cut a "V" shaped groove between the 2½-in. plates to prevent any sharp edge from sticking out to foul the shaft when it was again replaced. At the suggestion of the shop superintendent, the rotor was bored to four different diameters instead of two in order to reduce the distance required to press the shaft in the rotor.

After the rotor was bored, pin gauges were made for each of the four bores and the shaft was built up by welding and turned to the diameters in the rotor plus .008 inches. While the shaft was in the lathe with the upper end in the clutch and the lower journal resting in a steady rest, the top of the shaft, both journals and the rotor seat ran perfectly true. At this time a slight cut was taken across the bottom of the flange coupling and also across the top to make it perpendicular to the axis of the shaft. This flange was slightly bent which we have every reason to believe, occurred at the time the copper tubing ruptured on one of the hydraulic jacks. However the taper for the thrust collar for the Kingsbury bearing ran out of true .0015 in. both at top and bottom as an eccentric.

About this time an attempt to locate in Portland a hydraulic press large enough to handle the job was unsuccessful.

While the work was being done on the shaft the first strongback was reinforced by adding a 1½-in. steel plate to the top, machining the top and bottom to make them parallel and a new keeper of ½-in. steel plate was made to hold the nuts in position while pulling was in progress. When the second strongback was made, the holes for the rods were burned in the plates. This made the holes rather irregular and would al-

low the threads of the rods to foul and burr. This strongback was machined on the lower side and new holes were bored in the plates for the rods, to match the holes in the other strongback. These holes were fitted with brass bushings to prevent the rod from coming in contact with the steel plates. To prevent any bulging of the rotor plates during the pressing in process a steel ring 2½ in. wide and 4½ in. high and ¼ in. larger inside diameter than the bore of the rotor was provided. This was placed on the rotor close to the bore. A second steel ring 1½ in. thick and 33 in. in diameter was made to pass around the outside of the rods. These rings were machined top and bottom. The strongback was set up with a machined surface on top of the rings and the space between the inner ring and the shaft was packed with hard oil to prevent dirt from dropping in.

As we had no idea of just what pressure would be required to press the shaft to its proper position a disc or button of steel was made approximately 25 in. in diameter and several inches thick and machined so that the top would enter the counter bore of the bottom of the shaft and transmit the pressure up the shaft without exerting any pressure on the finished surface of the flange.

The bore of the rotor was carefully cleaned and after the shaft and rotor bore had been given a coat of white lead and lubricating oil, the rotor was placed on blocking above the shaft and the pulling rig arranged as mentioned. Careful measurements were taken on the rotor and it was levelled by means of a jack placed near the field poles on one side. The shaft was then lifted free by means of the crane and checked to determine if it was plumb. Although this shaft weighed 6,400 lb. and was suspended from the hook in the crane by means of steel cables it did not hang plumb. After a number of trials and adjustments however, the shaft was made plumb and centered in the rotor and was raised until it lifted the rotor from the blocking. The weight of the rotor (23 tons) was sufficient to enter the shaft approximately 2 inches. The pulling rig was then adjusted, first by tightening the nuts by hand, after which one man tightened up all the nuts by means of a 3-ft. wrench and the pulling was started. All nuts were turned only ⅛ of a turn regardless of how easy or hard they turned and 7 men pushing on a wrench handle 9 ft. long were able to pull the shaft in position in 2 hours and 46 minutes.

During the time the machine was shut down, the generator was thoroughly cleaned, the armature being washed by a spray of cleaning solvent. After the insulation was thoroughly dried the winding was sprayed with glyptal varnish. In the past it was found that the arrangement of lighting and the dark color of the lower part of the generator, particularly around the lower spider and steady bearing, made it almost impossible to see the various parts so these were all repainted with aluminum paint, which proved to be a great improvement.

The shaft and rotor were placed in position in the generator and the coupling lined up and the holes rebored for new coupling bolts. The steady bearings were put in place and the Kingsbury bearing assembled. The thrust collar was bored to fit the new taper on the shaft but was not bored large enough to allow the thrust collar to rest on the shoulder on the shaft. The thrust collar was heated and pressed on the shaft to the proper position by means of the lifting nut. After the machine was assembled and started it was found that the tapered end of the shaft on which the exciter shaft is mounted, ran out .008 in. The generator half of the coupling ran out .0015 in., while the water wheel shaft 10 in. above the top of the water wheel bearing ran out .003 in. A careful check was made of the upper end of the shaft and it was discovered that it was running eccentric and a new sleeve was made, one side being .007 in. thicker than the other. This was fitted to the shaft and a position found where there was only a throw of .0025 in. The exciter was then set up without the ball bearing and collar in place.

The machine was then started and it was found that the upper end of the shaft was wobbling somewhat so that the armature and shaft were again raised and the outer side of the new sleeve and the socket in which it fitted in the end of the exciter shaft were polished and the exciter shaft again slipped in place. This caused a reduction in the amount of wobble in the top of the exciter shaft but it was found that the shaft did not center in the ball bearing housing as it should and it was necessary to shim up the side of the exciter frame until the shaft was central in the ball bearing housing. The ball bearing slipped into place very readily when the machine was turned and stopped in various positions. With the ball bearing in place, the top of the exciter shaft ran out .002 in. These deflections were well within the tolerances of the main bearings which were .012 in. A new steady bearing above the water wheel was installed and the machine operated as slow as possible until this bearing was broken in.

These deflections on the shaft had to be measured when the water was shut off as it was impossible to hold the machine down to low enough speed to make shaft measurements. The Johnson valve was opened and the machine started after which the valve was again closed tight and measurements were taken while the machine was drifting. While attempting to take measurements on the top of the generator shaft it was observed that the shaft moved sideways .010 in. when the water struck the water wheel.

This repair work was extremely slow and the job was a long drawn out one. There was no machine shop nearer than Portland which was able to furnish the material and machine the equipment that was necessary. All parts were so heavy that they could not be handled by hand but had to be handled by means of a crane, the highest speed for the hook being 5½ ft. per minute. Besides this all labor was inexperienced except the shop crew which reamed the coupling and fitted the new coupling bolts and bored the rotor. Practically all the men were farm hands.

Our experience showed a number of things which might be valuable in the future and might be of considerable assistance to anyone who is faced with a similar problem.

1. An attempt to heat a piece of equipment the size of the rotor when the operations of pulling are so slow is a waste of time and fuel. The mass is so great that the temperature rises very slowly and the shaft temperature rises as fast as that of the rotor.

2. In pulling the shaft in place, the pulling equipment should be arranged so the strains are always parallel with the axis of the shaft and the pressure should be exerted on the rotor as near to the shaft as possible.

3. In pulling, the initial strain should be balanced on all rods and maintained so throughout the entire pulling operation.

4. All tension rods should be of the same size and material to maintain this balanced condition.

5. Some arrangement should be made on a unit of this type so it can be turned at slow speed and held there. This would also be valuable when bearings are to be broken in, and further would prevent unnecessary water hammer and surges in the pipelines and penstocks.

6. It would be an advantage to have an even number of holes in the rotor when work such as this must be done.

7. Our experience with this unit

would indicate that a flanged coupling of some sort between the exciter shaft and the generator shaft would have been an advantage.

8. The cutting of grooves in the rotor while very small, not only prevents the shoulder on the shaft from catching but also serves as a reservoir for lubricant which I have every reason to believe reduced the force required to pull the shaft home.

9. Boring the rotor to four diameters, instead of two, greatly reduced the work finally of pulling the shaft in position.

The machine has been in service for 6 months and is running smoother than it has ever been known to run before. There has been no perceptible change in the action of the machine during this period.

The cause of the trouble with the generator shaft might be traced to chemical action. Trouble with the Kingsbury bearing in July 1933 made it necessary to remove the thrust collar from the shaft to change the runner plate. When the unit was again assembled and the thrust collar was put in place, white lead and linseed oil were used on the shaft for lubrication. I understand that similar troubles are being traced to the use of this mixture and in the work which was done in this repair job, white lead and lubricating oil were used for lubricating the shaft and rotor, while lubricating oil and graphite were used between the thrust collar and shaft.

Cooling Combustion Chamber Walls and Floors*

By H. H. FINCH
Grays Harbor Railway & Light Company

THE Grays Harbor Railway & Light Co. has three 1,090 hp. Casey Hedges Stirling-type boilers installed in the Electric Park plant. The Dutch ovens and furnaces are designed for the use of wood waste and hogged fuel. For emergency use such as a break in the conveyor system or elevator, twelve Coen oil burners of the mechanical atomizer type were installed in the rear combustion chamber of each of these boilers. The first set was installed in 1927 and the other two in 1928. Many times since then it has become necessary to fire the boilers completely with oil fuel for several months duration on account of the shortage of hogged fuel due to cessation of sawmill operation.

The use of oil resulted in heavy maintenance of bridge walls, combustion chamber walls and floors. The most serious trouble experienced was with the combustion chamber floor. A reinforced concrete floor was used for the combustion chamber and was placed directly on the dirt. It was then covered with insulating brick, fire brick and sand. On one occasion when it was necessary to burn oil continuously for several months, the combustion chamber became so hot that the brick in the side walls and bridge wall spawled, and the concrete, insulating brick and fire brick in the floor became a molten mass which burst through the combustion chamber doors and spread itself over the concrete floor of the boiler room.

Investigation revealed that the heat from the combustion chamber floor had travelled down from 5 to 7 ft. From one boiler, with the use of air driven pavement breakers, we removed a solid mass of slag 4½ ft. thick. We tried several different methods of cooling and bottom ventilation, but in each case trouble would develop after a few days when the hot slag would plug up the ventilating holes. The last method tried has been in operation about a year and has worked very satisfactorily.

In eliminating the trouble the combustion chamber floor was dug out 50 in. deep and leveled off. The dirt around the edges of the concrete foundation was scooped out 6 in. deeper and concrete poured in level with the floor 15 in. wide. A 9-in. wall was laid up 6 in. from the concrete foundation to the level of the combustion chamber floor on all four sides, leaving a space of 6 in. for air—this wall being solid parallel to the bridge wall and oil front. The top of the 9-in. wall was stepped back to meet the side wall in 2-in. steps after the top of the concrete foundation walls had been reached.

On the two sides the wall was laid up in the following manner. A brick was laid parallel to the bridge wall, then a space was left the width of a standard fire brick which is 4½ in., then another brick and another opening, carrying out this procedure the width of the side wall. The openings are three bricks high. The same lay-up was carried out on the opposite side wall. A line of fire brick three bricks high was laid from side wall to side wall across the excavated combustion chamber floor matching up with the brick on the side walls three bricks high. Thus was formed tunnels or air passages one brick wide and three bricks high (4½ x 7½ in.) from side wall to side wall. The new floor of the combustion chamber was laid on top of these stretchers by placing 9-in. fire brick flat and two courses thick.

In order to connect up these air tunnels or passages with the outside air we cut away the concrete foundation on one side of the boiler wall below the combustion chamber door a depth of 12 in. We also cut back in the edges of the concrete and cemented in a channel iron and covered it with brick forming a floor for the opening into the combustion chamber. We thus separated the air chamber from the combustion chamber. The floor just outside the foundation was chipped out 24 in. x 24 in. x 12 in. deep as the door is 24 in. wide, and an angle iron frame was fitted in with a heavy two mesh screen. This opening protected by the screen formed the intake to the air passage. The same construction was carried out on the other side wall but instead of a screen, a 12 in. galvanized pipe nine feet high was sealed into the opening in the boiler room floor outside of the former combustion chamber door forming a chimney. This piece of pipe was picked up around the plant for the experiment and happened to be riveted and soldered. After the oil burning equipment was placed in service for twenty-four hours the heat passing out of this pipe was so great that the solder came loose from the joints. With natural draft oil burners we cannot take advantage of the preheated air from the combustion chamber floor.

Cooling of the combustion chamber lower walls was accomplished by air passing from one side of the boiler wall into the 6 in. x 50 in. air passage completely encircling the four walls of the combustion chamber and out through the other side wall of the boiler. The floor of the combustion chamber was cooled by numerous air tunnels or passages 4½ in. x 7½ set 4½ in. apart and running parallel to the bridge wall and connecting into the 6 in. x 50 in. air chamber on each side of the combustion chamber. This cooling effect was accomplished by natural draft which was quite noticeable when holding a piece of cloth over the intake screen. No draft measurements were ever taken. This was found to be an inexpensive method of combustion floor cooling and it effectively solved our problem of excessive heat and melted combustion chamber floors.

*A report prepared for Production and Generation Committee, Engineering and Operation Section, Northwest Electric Light & Power Association, for presentation at 1935 Annual Section Meeting.

In the Realm of Science + + +

[Devoted to the research and scientific developments which affect the electrical industry and which are being carried on in the engineering departments of Western universities. Edited this month by Professor F. O. McMillan, Electrical Engineering Dept., Oregon State College.]

Sphere-Gap Studies Aid High Voltage Design

ECONOMICAL design and successful operation of electrical equipment and systems requires an accurate knowledge of the safe dielectric strength of the insulation. Modern electric systems employ gaseous, liquid and solid dielectrics in various combinations. It is the present practice to try to coordinate these insulating materials in such a way that the self-healing gaseous dielectric will fail before the solid dielectrics are destroyed.

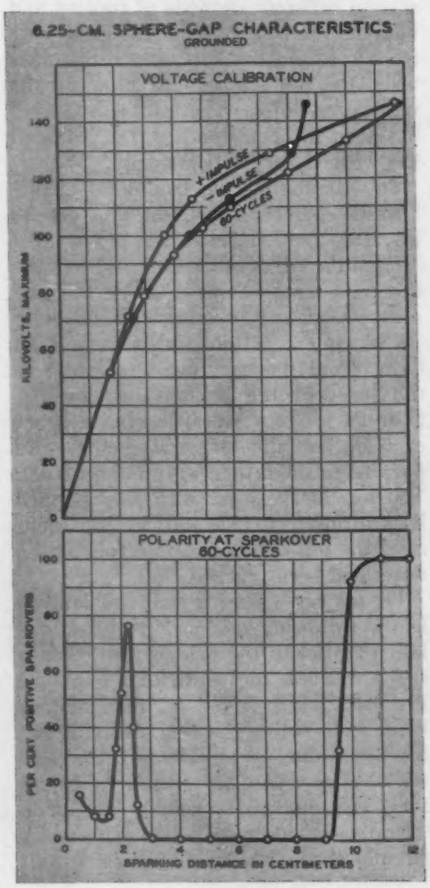
High-voltage measurements are obviously of fundamental importance in the determination of the dielectric strength of insulating materials for proper insulation coordination. Unfortunately, such measurements are difficult to make with high precision. As recently as five years ago the A.I.E.E. committee on power transmission and distribution found that the flashover voltages obtained by different laboratories for similar insulators differed by as much as thirty per cent for 60-cycle flashovers and 60 per cent for impulse flashovers. An investigation of these gross discrepancies showed that there were many contributing causes, but they may be summarized under the general headings of technique and the calibration of measuring instruments.

Since the publication of the classical papers by A. Russell in 1906, G. W. Dean in 1912 and 1913, Chubb and Fortescue in 1913, and F. W. Peek, Jr. in 1914, the sphere-gap has been the most widely used device for measuring both 60-cycle and impulse high-voltages. In recent years the sphere-gap has been supplemented by the cathode ray oscillograph. Even this instrument is not infallible, because it must be used with a voltage divider either of the capacitance or the resistance type when a voltage of any considerable magnitude is measured. Both types of dividers are subject to ratio error because of stray capacitance to ground.

In September 1930 a paper "The Influence of Polarity on High-Voltage Discharges" based upon research work at Oregon State College was presented before the Pacific Coast Convention of the A.I.E.E. in which data and sphere-gap characteristic curves were presented showing marked differences in the positive and negative sparkover voltages for sphere-gaps when measuring either 60-cycle or impulse voltages.

The experimental results show that symmetrical 60-cycle voltages spark over grounded sphere-gaps on both polarities only when the sparking distances are relatively quite short; at intermediate spacings the spheres spark over only when the ungrounded sphere is negative. For sparking distances somewhat greater than one sphere diameter there is a rather abrupt transition from 100 per cent negative to 100 positive sparkovers, and for sparking distances greater than this, the sphere-gap always sparks over when the ungrounded sphere is positive. A typical 60-cycle polarity characteristic for a 6.25-cm. sphere-gap is shown in the lower part of Fig. 1. This phenomenon, sparking over on 60-cycle symmetrical voltage only when the spheres have definite polarity relationships, shows conclusively that the positive and negative sparkover voltages are quite different for the sphere spacings that spark over only on one polarity, otherwise grounded sphere-gaps would spark over on either polarity indiscriminately at all sparking distances.

Fig. 1—Sphere-gap characteristics



The unidirectional impulse or lighting sparkover voltages for grounded sphere-gaps show excellent correlation with the 60-cycle data. At relatively short sparking distances no appreciable difference is found in the positive and negative impulse sparkover, at intermediate spacings the spark-over voltages are lower when the ungrounded sphere is negative than when it is positive, and at a sparking distance somewhat greater than one sphere diameter the negative sparkover voltage rapidly approaches the positive value, becomes equal to it, and then increases to a value considerable larger. Typical calibration curves for a 6.25-cm. sphere-gap taken with a ½ to 5 impulse voltage wave are shown in the upper portion of Fig. 1.

It has been the universal practice of high-voltage laboratories, when measuring impulse voltages by means of the sphere-gap, to determine the voltage from the 60-cycle sphere-gap calibration data given in A.I.E.E. Standard No. 4 "Measurement of Test Voltage in Dielectric Tests." The investigation reported in 1930 showed that negative impulse voltages measured in this manner are essentially correct, but that positive impulse voltages measured and evaluated by this method are much too low. The voltage calibration curves in Fig. 1 show the relation between the 60-cycle and the positive and negative values for the 6.25-cm. sphere-gap. Positive impulse voltages measured with the 6.25-

cm. sphere-gap and evaluated in the conventional way will be in error by as much as twelve per cent as shown by these calibration curves in Fig. 1. It is, therefore, necessary to use two calibration curves when sphere-gaps are used for measuring positive and negative impulse voltages instead of a single curve as used in the past.

These sphere-gap polarity characteristics reported in 1930 were at such variance with standard practice that they were not at first accepted. In June 1934 two papers were published confirming these characteristics of the grounded sphere-gap. The 1934 papers are "Calibration of the Sphere Gap" by J. R. Meador in *Electrical Engineering*, June 1934, and "Impulse Calibration of Sphere Gaps" by P. L. Bellaschi and P. H. McAuley, in *The Electric Journal*, June 1934. A more recent paper "Cathode-Ray Oscillographic Studies of Surge Phenomena" by T. E. Allibone, W. G. Hawley, and F. R. Perry in the *Journal of the Institute of Electrical Engineers* for November 1934 also confirms the existence of these previously unrecognized sphere-gap characteristics.

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Simplified Measurements of Sound Absorption

A METHOD of measuring the sound-absorbing properties of acoustic materials has been perfected by Tom B. Wagner, former graduate student and now a member of the technical staff of KOAC, the Oregon State College broadcasting station. His work was directed by Arthur L. Albert, Associate Professor of Communication Engineering, and was reported in a joint paper published in *Electrical Engineering* for August 1934. The method employs the well-known standing wave phenomena. Sounds from a loud speaker in a large wooden tube are directed against the material under test which closes the end of the tube. The waves reflected from the absorbing material interfere with the oncoming waves, causing standing waves along the tube. If the material is a good absorber, there will be little reflection, and hence small standing waves. These waves are explored with a crystal microphone connected to a suitable amplifier, and from the magnitudes of the waves the sound-absorbing properties are determined. The particular contribution made by Mr. Wagner was the adaptation of high-grade communication equipment and the development of a reliable measuring procedure. The method is especially adapted to routine tests and experimental investigations where many tests must be made. It should find application in plants manufacturing insulating and sound-absorbing material.

A Thermionic-Tube Measuring Instrument

THIS development was also made by Mr. Wagner under the supervision of Professor Albert. The paper was awarded the 1933 national A.I.E.E. prize for the best student paper, and was published in *Electrical Engineering*, December 1934. With this device, measurements of current, voltage, power factor, and power can be made over a wide frequency range, and at lower power levels. The instrument is, therefore, adapted to measurements in communication circuits.

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Letters...

Let Electra Learn Something About Lamps

To the Editor:

Sir—I have been a consistent reader of the department "..by Electra's Husband" and, of course, as an incandescent lamp man I could not fail to miss Electra's complaint in the March issue relative to the failure of our American inventive geniuses to standardize our incandescent lamp bulbs.

Won't you please convey to Electra for me the fact that this is a problem which was recognized a number of years ago by the General Electric Company and its Incandescent Lamp Department engineers and as a result, in 1925, the new standard line of inside frosted lamps known as the simplified line, was designed and brought into production. This line fulfills the needs of practically all of the customers who use lamps for home lighting and actually, of course, fulfills the needs of practically all of the customers who use lamps for home lighting and actually, of course, fulfills the needs of more than 80 per cent of the lamp requirements of the industry.

From this it would appear that the Incandescent Lamp Department engineers were at least trying to keep abreast of the times and that, in spite of the fact, that many of our customers still insisted that they wanted lamps of shapes which we had considered obsolete many years ago.

Now, as to the specific complaint of Electra. If the beautiful floor lamp which he received two or three years ago took a 75-watt lamp and the man who designed the floor lamp used (as we must assume from the article) a standard lamp, the one which was used was the 75-watt simplified line lamp made in the A-23 bulb. This lamp was 2⅞ in. in diameter with a maximum overall length of 6-1/16 in. Incidentally, except for the wattage rating, it was identical with the 100-watt lamp which was also made in the A-23 bulb.

In 1932 the 75-watt lamp then carried a list price of 35 cents. In 1932 the efficiency of the 75-watt lamp was increased, which enabled our engineers to manufacture it in a smaller bulb, namely the A-21, which was 2⅝ in. in diameter and at the same time the overall length was shortened to 5-5/16 in.; however, the list price was reduced to 20 cents. However, we did not discontinue the manufacture of the 75-watt lamp in the A-23 bulb, although it was not commonly stocked by dealers. This lamp was still available at a list price of 35 cents.

Please note that Electra was buying her floor lamp at the time this smaller lamp was available. Evidently the designer of the floor lamp was not keeping up to date or of course he would have designed it for the 75-watt A-21 bulb. Electra, not being able to procure the smaller lamp, states that the larger one would not fit because it was "too fat". This seems remarkable in view of the fact that the 100-watt A-23 bulb had exactly the same dimensions as the old 75-watt A-23 and, therefore, there should have been no difficulty in fitting this lamp to the floor lamp. In order that Electra may have the opportunity of trying this, I am forwarding you, no charge, one 100-watt lamp whose dimensions are identical with the old 75-watt A-23 bulb lamp. Please ask Electra to try it and see if it will not fit.

It has just occurred to me that there is a possibility that Electra's lamp was designed for the old 75-watt PS-22 bulb lamp whose shape is somewhat different than the present A-23 bulb but whose manufacture was discontinued ten years ago. Can it be that Electra's floor lamp is that much out of date?

In view of the constantly increasing standards of illumination, can it be that Electra has failed to read our advertising in the various national magazines dealing with the Better Light-Better Sight Movement? Had she read this and acted upon it, as she should have in the interest of saving her eyes, as soon as the 75-watt A-23 bulb lamp burned out she would have replaced it with a 100-watt A-23 bulb lamp and would never have experienced any difficulty. Incidentally, of course, Electra would have had improved lighting and saved her eyes. For not only Electra's information but also that of her husband, I am enclosing two copies each of two pamphlets, one entitled "Things I Never Knew Until Now," and the other entitled "Let's See!" I would appreciate it very much if you would pass on the foregoing comments to Electra and her husband.

M. C. HIXSON,
Manager, Incandescent Lamp Department,
General Electric Co., Pacific Division.

Lamp and booklets have been sent to Electra's husband. We suspect both are chastened.—Ed.

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Arvida Works Belong to Aluminum Ltd. of Canada

TO THE EDITOR:

Sir—The February, 1935, issue of ELECTRICAL WEST has just come to my attention and I have enjoyed reading the article, "Wanted: Buyers for One Billion Kw.-hr."

Unfortunately, a statement made in the last full paragraph on page 30 of this article happens to be contrary to fact. Aluminum Company of America built the aluminum works at Arvida, Canada, but when Aluminum Limited was formed in 1928, the Arvida Works became part of Aluminum Limited. This is a separate and distinct company having no connection with Aluminum Company of America. It has its own officers and directors. While the stockholders of the companies were identical at the time of its formation, this is no longer true.

The reduction works of Aluminum Company of America are located at Massena and Niagara Falls, N. Y., Badin, N. C., and Alcoa, Tenn., but the reduction works at Niagara Falls has not been in operation since August 1, 1931.

DOUGLAS B. HOBBS.
Aluminum Company of America
Pittsburgh, Pa.

Codes in Operation + + +

[Practical and significant suggestions from the code authority chairmen of this territory telling how to make code operation effective]

Decentralization Proposed for N. E. C. A. Operations

DECENTRALIZATION of association operations along the same lines that code administration has been developed was proposed at the recent meeting of the National Electrical Contractors Assn. which met in Chicago, according to Lloyd A. Flatland, executive committeeman for the Pacific Coast region and a member of the Code Authority for the electrical contracting division of the construction industry.

According to Mr. Flatland, proposals were made which will soon be submitted to the membership for changes in the constitution and by-laws of the N.E.C.A. to facilitate the new decentralized policy. Roughly the plan is to regionalize the association with an executive committeeman in charge of each region. Payment of the $15 annual dues will be made accountable to the region chairman. Out of this, $10 will remain in the region for local and regional activities, provision of a field staff if necessary, while the remaining $5 will go to the national association for its support.

The financial condition of the N.E.C.A. was reported to be in better shape than at any previous time in its existence. This was due to the impetus given membership by the code activity. The association is now going to divert considerable of its headquarters' attention to benefits for the membership, since the hard work of the code forming and setup has been accomplished. In order to maintain the strong membership now existing, larger benefits are being planned for the members along all fronts.

Reports from all over the nation show that the contractors are on a more friendly basis with the utilities and are anxious to assist them in their relations with the public. Together with the inspectors association, the N.E.C.A. has a committee working on consumers' wiring with a view to simplifying and lowering its cost so that more of it can be installed. In the meantime a committee has been set to work studying the results of bare neutral and concentric wiring systems which have been fostered by manufacturers and certain utilities in some districts.

Mr. Flatland also stated that a new problem confronts electrical contractors in the factory-built homes now being offered the public. These are completely built in the factory and leave no wiring to be done on the premises.

With wholesalers and manufacturers committees had reported little progress in improved understanding regarding classification of accounts and adequate discount margins.

The national association has recognized, according to Mr. Flatland, the change in conditions and recommends a more sympathetic relation with organized labor, he said.

In the motor section a conflict between the N.E.C.A. and the National Industrial Service Assn. has resulted in a deadlock on extending the construction code to cover operation in motor shops. Some concern is also felt by contractors over the fact that in many regions where governmental projects are being installed, farmers and their sons are being educated by government men to become wiremen, thus depriving local contractors of business opportunities resulting from such projects. Strong resolutions were passed recommending to the government that separate bids be called for mechanical trades instead of including these under the general contract. Support was also voted the construction league in its program to have the construction industry participate in public works projects considered under the $4,800,000,000 relief program.

Membership in the national association from California was shown to be the largest of any in the nation, a fact in which Westerners might take considerable pride, according to Mr. Flatland.

HOW various associations operate will be told in these columns from time to time. In the January issue the San Francisco association procedure was outlined. Next month the equally successful Los Angeles association set-up, which has many different features of administration and operation will be described in these columns. Following that a description of an association covering several towns in adjoining counties in the San Bernardino and Riverside area of southern California will be described. *Electrical West* feels that these will be helpful to electrical contracting organizations throughout the West in formulating their own policies and improving their own methods of operation. It will be glad to obtain additional information for such groups upon request.

Los Angeles Contractors Issue Labor Data

CULMINATING two years work on the part of a special committee, the Southern California Chapter of the National Electrical Contractors' Assn., Los Angeles branch, has just issued in printed form a manual of labor units for electrical estimators. The work is the simplification and revision, for southern California building conditions, of the Electragists' system of estimating, developed many years ago by Arthur Abbott.

Originally issued as a mimegraphed document, it is now printed and is being distributed to electrical contractors in southern California at $1 a copy, which covers the cost of printing and also establishes a definite value so that it will not be treated lightly by whoever receives it.

Important is the fact that the Frank Wiggins Trade School in Los Angeles is starting an estimating class and using this manual as a text book. Students at the school will take off quantities from actual plans and specifications based on the manual. The class is limited to those who are in a position to profit from it, which means that it is limited to electrical contractors and their estimators.

The foreword states that the manual covers only standard installations and refers the reader to the Electragists Manual for any special data not covered. "Many of the tables (of the Elec-

tragists Manual of Estimating) have been transferred bodily to our manual, some have been deleted as not applicable to this locality; many new data have been added—including several entirely original tables—and all of the man-hour units have been modified to bring them in line with southern California conditions." Publication was made with the consent of the copyright owner, the National Electrical Contractors' Assn.

All labor units are in man-hours and are to be multiplied by the hourly scale to reduce them to dollars before being applied to estimates. Where mixed crews of journeymen and helpers are employed, the formula is given for this calculation.

Included in the manual are the following headings: Job Factors, Branch Circuit Conduit Boxes, Branch Circuit Wire and Ducts, Standard Panels, Special Panels, Service Conduit, Fastenings, Large Wire, Externally Operated Switches, Switchboards, Gutters, Feeder Taps, Equipment Boxes, Electric Heaters, Thermostats, Metal Raceways, Devices Attached to Existing Outlet Boxes, Bells, Phones, Ditching, Power Conduit, Apparatus, Controllers, Starters and Speed Regulators. Copies are available at the Los Angeles Branch of National Electrical Contractors' Assn., 335 Rowan Building, Los Angeles, A. H. Gudie, secretary.

The association committee whose labors for many months produced the booklet, consisted of L. H. Ellett, chairman; C. A. Rowley, Pasadena; R. M. Fry, Harry Hamm, C. J. Bennett and H. C. Nicholas, Los Angeles; and P. R. Mactolf, Glendale. Messrs. Mactolf, Ellett and Rowley, all experienced contractors and estimators, are instructors of the class in estimating at the Frank Wiggins Trade School, a unit of the public school system of Los Angeles, the electrical division of which is under the direction of E. F. Reynolds.

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Northwest Arranges Labor Agreement

A collective bargaining agreement between employers and employees in the electrical contracting division of the construction industry in the region of Clackamas and Washington Counties in the state of Oregon and Clark and Skamania Counties in the state of Washington was announced by the National Industrial Recovery Board. This bargaining agreement refers to the territory surrounding Portland, Ore.

The agreement provides a maximum 30-hour, 5-day week and 6-hour day with regular hours from 9 a.m. to 4 p.m., a minimum wage rate of $1.20 an hour for journeymen, $1.35 an hour for foremen and a scale for apprentices ranging from 40 cents an hour for the first year to 75 cents an hour for the fourth year.

Participants in the agreement were the Portland Electrical Contractors Assn., representing the employers, and Local Union No. 48, International Brotherhood of Electrical Workers, representing the employees. The board pointed out that the volume of work in the region had dropped a total of 62 per cent from 1929 to 1933 and average earnings of journeymen declined in that period from about $1,562 a year to about $592 per year.

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District 11 Chairmen Named by Hepler

District chairmen and local administrative committee chairmen for the districts of the 11th region, approved by the code authority, have been announced by Sam G. Hepler, chairman of the region, to be as follows:

District Chairman

J. J. Agutter, District No. 1, 600 Harrison St., Seattle.

J. R. Tomlinson, District No. 2, 219 Weatherly Bldg., Portland.

F. E. Smallidge, District No. 3, 112 Orondo Ave., Wenatchee, Wash.

D. F. Henderson, District No. 4, S. 118 Lincoln St., Spokane.

A. E. Dickey, District No. 6, 130 Shoshone Ave., West Twin Falls, Idaho.

A. A. Nicolaus, District No. 7, Empjire Bldg., Billings, Mont.

E. J. Palmquist, District No. 8, 420 N. Main St., Helena, Mont.

Local Administrative Chairmen

District No. 1, Area No. 1—J. J. Agutter, 600 Harrison St., Seattle.

Area No. 2—J. C. Beckman, 2701 6th Ave., Tacoma.

Area No. 3—A. S. Clark, 1223 Commercial St., Bellingham.

Area No. 4—E. A. Jones, Hoyt and Hewitt Ave., Everett, Wash.

Area No. 5—F. W. McEachron, Hoquiam Electric Co., Hoaquim, Wash.

District No. 2, Area No. 1—R. C. Kenney, 115 N.W. 9th Ave., Portland.

Area No. 5—L. B. Swigart, 956 Willamette St., Eugene, Ore.

Area No. 8—Ben Trowbridge, 212 West Main St., Medford, Ore.

Area No. 9—Chas. D. Garcelon, 407 Main St., Klamath Falls, Ore.

District No. 3, Area No. 1—R. J. Pounder, 744 S. Wenatchee St., Wenatchee, Wash.

Area No. 2—A. J. Gladson, Yakima, Wash.

Area No. 4—G. R. Washburn, 16 Kennewick Ave., Kennewick, Wash.

Area No 3—J. L. Vaughn, 206 E. Court St., Pendleton, Ore.

District No. 4—Area No. 1—A. F. Cook, 818 4th Ave., Spokane, Wash.

District No. 6, Area No. 1—H. L. Dickelacker, 115 Main St. E., Twin Falls, Idaho.

Area No. 2—E. W. Hall, 246 N. Main St., Pocatello, Idaho.

Area No. 1—B. B. Sullivan, 320 S. 33rd St.

District No. 8, Area No. 1—D. F. Goggans, 206 Central Ave., Great Falls, Mont.

Area No. 2—Phil Shane, Shane Elect. Co., Bozeman, Mont.

Area No. 3—F. H. LeSage, 129 West Park St., Butte, Mont.

Area No. 5—R. F. Hollingsworth, 419 1st Ave. East, Kalispell, Mont.

N.E.M.A. Announces Area Committee Setup

Area committees, a distinctly new activity for the National Electrical Manufacturers Assn., was a new plan approved at the last meeting of its Board of Governors. This plan would have special significance in the West since such organizations would provide a closer contact and administration of this region's manufacturing in relation to its own problems out here in the West. The new policy embraces the establishment of committees of members in geographic areas selected largely as marketing areas.

Among the list of advantages of such a set-up are given that it will create a better team spirit and reduce the preponderance of individual section attitude in N.E.M.A.; develop a broader acquaintance, aid in keeping members sold on activities, serve as nucleus in handling city, county or state legislative matters, handling publicity locally, aiding code administration, arranging local or area meetings of members and nonmembers, provide convenient sources of information and statistics and help to increase the membership of the association.

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• Specialty Transformer Manufacturers, of which there are a number on the Pacific Coast, will be interested in a proposed supplemental code of fair competition for such manufacturers as a subdivision of the electrical manufacturing industry which had its first hearing on March 15. In the definitions manufacturers of radio transformers, luminous tube transformers, signalling and control transformers and street lighting transformers are included. There are price filings, customer classifications, selling below cost, trade practice provisions and, significantly, liquidated damage provisions in the code.

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• Beginning What it maintains will be a constant contact with various groups operating under codes, the Western regional offices of NRA in San Francisco began with a group meeting of electrical contractors in San Francisco recently. Wesley Ash told of the new autonomy of the NRA regional divisions in the Pacific states and of the purposes to make enforcement an actuality immediately. Mr. Boland, legal counsel for the region, made no bones about the intent to obtain code compliance immediately. Bringing the meeting into focus on contracting problems were Charles Langlais, E. B. Kenney, Robert Griffin, Lloyd Flatland and Joseph Carlson, all of the Electrical Contractors Assn. of San Francisco.

EDITORIAL

APRIL, 1935

Time for United Action

IN spite of the very widespread debate aroused by the Public Utilities Bill now before Congress, the debate is confined largely to the holding company provision. Disastrous as this provision may be, still more disastrous are other provisions tucked away in the highly complicated structure and intricate legal phraseology of the 178 pages comprising the proposed act. By false propaganda, acrimonious attacks, and crafty politics, the administration has successfully succeeded in camouflaging the act as a holding company regulatory measure. Whereas, in intent and in facts, this bill would place the legal, financial and operating control of every operating company in the United States under the despotic tyranny of federal bureaucracy. It is a cleverly disguised attempt to deceive the American public into socializing the electric and gas industry and place it under complete federal control.

Examination of the act reveals the following "jokers":

(1) It gives the Federal Power Commission control over all utility rates.

(2) It provides that the basis of valuation for rate making purposes will be the "prudent" cost of the facilities involved, completely rejecting the idea of "present fair value" long upheld by the United States Supreme Court.

(3) It emasculates the commission form of state regulation by giving the Federal Power Commission jurisdiction over operating company rates.

(4) It restricts the power of the federal courts to hear appeals from rulings of regulatory bodies, the normal fact-finding role of said courts being absorbed by the Federal Power Commission.

(5) It authorizes the Federal Power Commission to order additions, extensions, improvements to and changes in facilities, irrespective of whether the utility is able to obtain the funds required. It further permits the commission to order interconnection, the use of facilities by others, the use of the facilities of others, sale to, purchase from, transmission for, exchange with other persons all on terms and conditions prescribed by the F.P.C. While "others" may be other utilities, industries, etc., it does not take a very astute person to guess that recent federal power developments are presumably the principal objectives of these provisions. This section of the act would permit a government power project to use a utility's own facilities for competition with it at any point on that utility's system.

(6) It gives the Federal Power Commission the power to determine operating and business practices including labor policies, pension plans, salaries, purchasing, etc.; the supervision over all contracts and arrangements regarding services (legal, engineering, financial, etc.) sales, and construction.

It is a fantastic piece of legislation which on one hand proposes to eliminate centralized management, engineering, financial services of various holding companies as being inimical to the public interest, and on the other and in the same act creates a single gigantic holding company of federal bureaucracy dominated by politically ambitious incompetence.

No sane person could expect an operating company to survive under the provisions set forth in this act. The obvious intent of the bill seems not to regulate industry but to force it into the hands of the government. It has the power to use the facilities of private utilities to dispose of governmentally produced power at terms prescribed by the government. Under these conditions competition is mockery. This bill, hailed by its radical proponents as utility regulation in the public interest actually is business destruction in the politicians' interest.

Passage of the Public Utilities Act in its present form would be disastrous not so much to the operating companies as it would be to the American people. Such an eventuality would be the first step in the complete socialization of all industry the prosperity of which, in the final analysis, determines the comfort, wellbeing, and happiness of the general public. Government operation *a la* U.S.S.R. is not well recommended as a means of preserving the freedom, initiative, and living standards of Mr. John Citizen.

Turning Loss to Profit

POWER companies in the Pacific Northwest, through intensive study and investigation, have developed a new approach to selling the so-called minimum or "loss" customer. Basic problem was to find that service best rendered by electricity which this type of customer could use, appreciate, benefit from and ultimately pay for. The answer, in the opinion of commercial managers, lies in the chest-type refrigerator.

Coupled with low first cost and low operating cost are the tangible service that this appliance can provide in the home and the popularity of electric refrigeration built up by years of advertising and promotion. These augur well for the success of the plan to concentrate sales effort on this device in approaching the minimum customer. The ability to provide a five-year guarantee also enables the companies to offer long terms that place ownership and operation of the appliance within the means of the low income customer.

With upwards of 40 per cent of all domestic customers falling into the minimum or loss classification, there is a tremendous market opportunity open to the industry if these preliminary sales programs succeed. In addition, these customers will get an appreciation of the service of electricity and at the same time earn lower rates which will make possible future sales.

Tit for Tat

OF course there is no true righteousness in politics. Instead there is a masterfully fashioned false face which looks righteous and is worn for vote-getting purposes. But realistically, it is expediency which rules, the political end justifying any means.

It is too much to expect, therefore, that newspapers would evaluate properly and honestly such politically inspired revelations as the list of utility executive salaries, expenses, and contributions to organizations or to charity. Particularly hopeless, is this where newspapers happen to be hostile for political—even mercenary—motives. To inquire whether a contribution of $75 to the Boy Scouts was made from innocent or altruistic public spiritedness would be unromantic, because it would probably reveal mere decent motives. That would not sell many papers. How much more politic to insinuate vicious subversive intentions—such as contributing to the delinquency of minors, for instance—to any and every such donation of funds. To do so places the newspaper in the vanguard of "outraged justice", an angel of wrath protecting the defenceless public—for a consideration, of course.

Is expediency so bedazzling that it blinds the press to its own vulnerability to government regimentation, if not outright ownership? Cannot the leadership of a press so gifted in imagination envision some implication of its own future if it continues to assist, even to lead politics to enlarge and extend an already tremendous payroll of bureaurocracy by such methods? Is it blind to recent European experience in which the first acts of government by dictatorship have been to silence or to muzzle a free press?

Great hubub is made over the listings of salaries paid utility executives, their expense accounts, and the contributions made to clubs, charities, and civic events. Particularly vicious in their sneering are those newspapers which seem to have a phobia to drive an ignorant public into buying itself into government ownership of everything regardless of consequences. By the trick of a "signed article" by one of the staff members, such papers editorialize and propagandize in their news columns. They generate the suspicion that surely such salaries, such donations are wicked. The self pity of the public is appealed to by showing that such expeditures must be paid for out of the electric rates. And the cure, they imply, is public ownership.

Suppose one were to turn the situation about for a moment. Some impertinent questions suggest themselves—but not more impertinent than those which have given rise to this gossip-mongering demand for "publicity" to incomes, expenses, and operations.

What salaries do the owners of the newspaper receive, for instance? (And how many private owners are there to a newspaper as compared to the "privately-owned" utility with its thousands of stockholders?) What do their expense accounts come to? Do they attend conventions or make business trips, or entertain a "juicy advertising account"? Or do they just "chisel" and "mootch", riding the special privileges of the power of the press?

By the way, what pay do the reporters receive, compared to the executives? (Here is a favorite innuendo which we too can indulge in on this score). Do they ever buy a lunch for someone, or treat anyone to a highball to get him to tell his story more glibly; or do they "chisel" because a reporter is a special creature who knows no social obligations?

What organizations, what civic groups does the newspaper contribute to—Boy Scouts? Newspaper Publishers' Assn.? Kiwanis? Warm Springs Foundation for Crippled Children? Chamber of Commerce? Or does it parade as a great public benefactor without ever dipping into its own pockets to make a concrete, tangible contribution to a worthwhile movement? And if it does make any contributions, pay any dues, lawyers' fees, or buy any dinners for visiting advertising prospects, do not these expenses come out of the poor readers', the poor advertisers' pockets in subscription and advertising rates?

Obviously these are all childish, immature questions, yet are they not the very character of suspicion-arousing implications made by the press in its treatment of the bare statistics of salaries, expenses and contributions? The only answer to such questions is, "What of it?" Does not all business have such expenses, and why should it not have them? They are a part of our American business pattern, to which newspapers too, unless they evade or "mootch," must contribute also.

And while one is about it, is it not high time that we investigated congressional and legislative travel allowances which still remain at such generous rates as 10 cents a mile? And what about their expense accounts, and these convenient junkets to make a study of the wild life, the flora and the fauna of the finest fishing grounds during legislative recesses? These are far more wastrel dissipations of the people's money than the biggest salary paid any utility man. Often he earns his salary in good judgment, in responsibility and in management of an intricate organization of machines and men. At least he endeavors to see where he can save the public money instead of how much more he can spend.

Significant Trends + + +

[*Signposts which point the road to improved business or method, brief, pertinent, useful hints as to HOW someone has blazed a new trail*]

Fabricating sheds of Kingsland Granite Co. at Madera. Here the rough stone brought in from the quarries, is cut, squared and numbered, placed upon cars and on leaving the plant is ready to be put in place on the building. The plant is in operation twenty four hours daily. Photo was taken during a lull at shift changing time

Night Lighting a Boon To Granite Plant

THE stone fabricating plant of the Kingsland Granite Co., located at Madera, Cal. is a veritable bee-hive of activity. Electric cranes race back and forth, stopping here and there with uncanny accuracy. At night a torrent of light, from six 1,500-watt G. E. floodlights which supplement some 12 kw. in general lighting, belie the fact that the sun has set. Work goes on, cutting, grinding, polishing—uninterrupted production of granite building stone.

San Francisco watches the granite walls of the new Federal Building at the civic center, rise day by day as this same stone is received and each block of granite put in its predetermined place. The foothills near Madera have furnished practically all the granite in the other civic center buildings, as well as for many other massive structures such as the Sub-Treasury Building, the City Hall of Los Angeles, many of the beautiful buildings on the campus of the University of California.

When the Kingsland Granite Company was awarded the granite contract for the Federal Building it had no plant west of the Rocky Mountains. To establish one in the west took precious time, for there was a penalty clause in the contract, pertaining particularly to stone delivery schedules. Hence, once in operation, the plant must run at peak capacity to avoid penalties.

Soon after the 900 hp. in electric motors began to hum, Superintendent Johnson of the granite concern began to have forebodings, particularly when he found the work slowing up on the night shifts. Power company lighting specialists were consulted; The accompanying photograph tells most of that story.

The fabricating shed covers an area of 22,500 sq. ft. Light meter tests show more than 5 foot-candles average intensity at all working levels. Sharp shadows have been eliminated. Work on the night shift has been speeded up, and according to Superintendent Johnson, "We are ahead of schedule on deliveries, we have practically eliminated accidents and we have not spoiled a single stone since lights were installed."

...in Western Manufacturing

Model Aids Mechanics In Plant Construction

AN adaptation of an idea developed by Union Oil Co. engineers may prove valuable to other construction men. When this company decided to build a new plant to produce a new brand of lubricating oil, a small model of the complete installation, built accurately to scale and showing the entire area to be covered, was made. The model was built to scale on a flat wooden base and the area between buildings and other mechanical units mortised out to a depth of approximately one-quarter of an inch. Structures were represented by wooden blocks affixed with dowels which fitted into holes in the base at the proper location of each building.

Because there are a number of piping installations required in a plant of this type, blue-prints become extremely complicated and hard to work from in the field. As a means of making the working drawings less confusing to the mechanics, each piping installation was drawn to the scale of the model on a separate sheet of paper. The paper then was cut to fit the mortised-out area between the plant buildings. Thus the steam piping or the electrical conduit installation could be shown in its exact relation to the actual layout in the plant and the electrical crew could follow the drawing with ease. Similarly each piping installation in every building was superimposed on a separate floor plan of that building. When completed there were as many separate drawings set into the model as there were piping systems, each drawing containing complete details of that particular piping system. The completed model is retained as a handy reference for repairs, changes and re-location of equipment, its use eliminating laborious checking of each system on the master drawing of the entire plant every time the maintenance crew is required to work on a particular piece of equipment.

•

• CLUB CARS on the Southern Pacific are equipped with a greenish glass window to filter out the hot infra-red rays and to give a cool appearance to the inside of the car.

• A REVERSED APPLICATION is the installation of an amber colored skylight in a mountain home so that even during cloudy winter weather the appearance of sunlight will flood the room.

...in Engineering

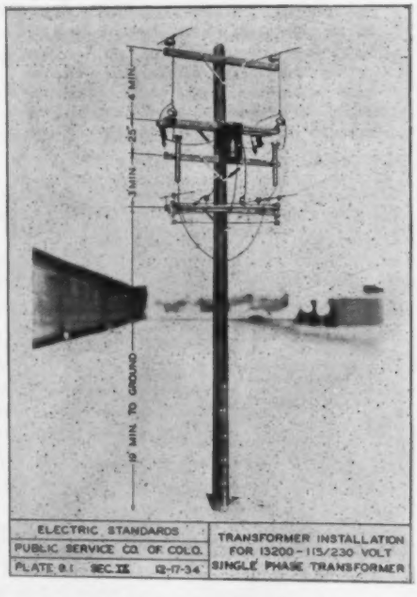
Models Aid Field Construction

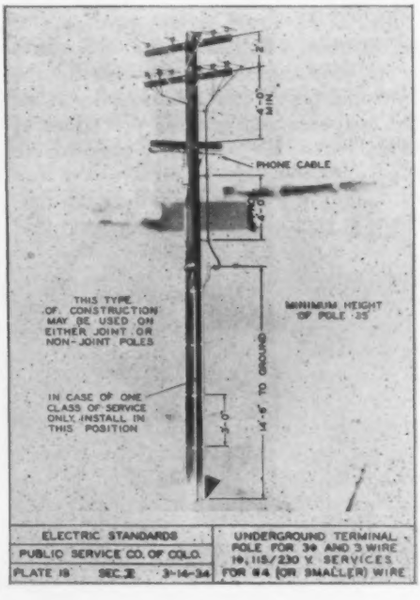
By R. A. HAMMACK
Overhead Standards Engineer
Public Service Company of Colorado

MODEL distribution structure, developed originally for the purpose of discussion of construction standards by the engineers and line foremen, have enabled a new type of field construction standard. All models were carefully made to scale, so that clearances and climbing and working spaces might be readily and accurately measured. Much has been done in this way to improve and make safer working conditions. Likewise, various economies in design have been worked out. Through class discussions of the models, weaknesses in present standards were brought to light, and new methods and designs were considered. The models proved a very great aid in creating and holding interest in the meetings and in promoting a comprehensive discussion.

The first models were made to a scale of one inch to the foot. Insulators, lightning arresters, and other such items were turned from brass. Later it was found more expedient to build on a scale of two inches to the foot, so that these items might be turned from wood and that standard bolt sizes could be used. All braces, brackets, and other hardware were of brass or steel and coated with aluminum paint.

These photographs of model distribution structures are a part of the overhead standards used by construction crews of the Public Service Co. of Colorado




4'-0" MIN
PHONE CABLE
2'-0"
THIS TYPE OF CONSTRUCTION MAY BE USED ON EITHER JOINT OR NON-JOINT POLES
MINIMUM HEIGHT OF POLE 25'
IN CASE OF ONE CLASS OF SERVICE ONLY, INSTALL IN THIS POSITION
3'-0"
14'-6" TO GROUND
ELECTRIC STANDARDS
PUBLIC SERVICE CO. OF COLO.
PLATE 18 SEC. II 3-14-34
UNDERGROUND TERMINAL POLE FOR 3Φ AND 3 WIRE 1Φ, 115/230 V. SERVICES FOR #4 (OR SMALLER) WIRE

All items representing porcelain were painted glossy brown, and the poles, crossarms, and other timbers were stained to a more natural aged color.

Having used the models to such good advantage in group discussions, it was decided that pictures of them would be more easily read and understood in the field than would the usual detail drawings. With this in mind, photographs were taken; governing dimensions, title, etc., put on; and the whole copied. Photostats were then made from the copied negative and it is reprints of these that are shown herewith.

While to date standards of this type have been used on a very limited basis only, they have met with enthusiastic approval by the construction department. Only one view of each installation has been included here, while two are required in the field for the more complex installations. Wiring diagrams accompany such picture standards when required. Dimensions of timbers and other details are not shown, as these are embodied in a material list which accompanies each order.

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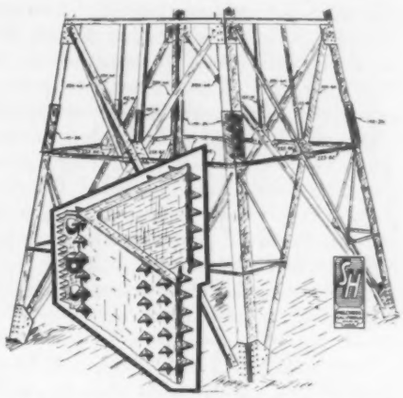
Tower Guards Safeguard Life

THAT steel towers are attractive to small boys with the climbing instinct is an established fact. Because they do not realize the hazards involved it has been necessary to devise various methods of preventing the possibilities of fatal accidents by making it difficult for children to climb the structures.

A recent development, which is the result of collaboration between the Smoot-Holman Co. of Inglewood, Calif. and the operating and engineering personnel of the major California utilities, seems to offer an effective and economical means of preventing unauthorized persons from climbing steel towers. It consists of a sheet steel guard member having closely-spaced sharp steel points and formed so as to clamp readily on the structural shapes used in tower construction. One guard is applied to each member of the tower at a height which will prevent an ordinary ladder overreaching it and thus provides a protective band around the tower. Sharp and substantial, the points will pierce



Sketch of the new tower guard now being used by many California utilities

the ordinary glove or garment and cannot easily be flattened down. Neither can an effective hold be obtained between the points.

Guards can be adapted to any type of tower, standard forms being available for any angle between 1½ and 6 in., in any position or for two angles back-to-back. Holes for linemen's removable step can be punched into leg section while forming the guard.

•

New Type Diesels Ordered For Navy Submarines

TWELVE of the thirty diesel engines recently ordered by the U. S. Navy from Fairbanks, Morse & Co. will be of a type not previously built in this country. Known as the "opposed piston" type, the new design differs from conventional combustion engine practice in that there are two pistons (an upper and lower) in each cylinder. Two crankshafts, one above and one below the cylinders, are driven by the upper and lower sets of pistons respectively.

The most obvious advantages of the new design are compactness and light weight per hp. developed, improved combustion efficiency also being claimed as a particularly important feature. All of these characteristics are highly desirable, not only for submarine service but also for other types of marine, air, and terrestrial transportation.

...in Wiring Rules

Inspectors See Lightning Made

CONCERNED as inspectors only with grounding as a means of protecting the wiring system and the property of consumers from the effects of unusual electric surges or breakdowns, the members of the Southern California chapter, Southwestern Section of the International Association of Electrical Inspectors, at their meeting March 20, were treated to a demonstration of lightning and of its tremendous power to destroy. The meeting was held at the California Institute of Technology, Pasadena, where new surge generating equipment had just been installed for the purpose of making extensive studies of lightning and of protection from it by bonding and grounding.

Oddly enough the business session of the inspectors' meeting had been largely taken up with discussion of the code lesson on Article 9 of the National Electrical Code, which has to do with grounding.

Chairman Jack L. Crannell, of Glendale, opened the morning session with the code lesson discussion, secretary Herbert Ufer acting as leader in the absence of R. H. Manahan. V. W. Hannum, superintendent of the Anaheim lighting department, followed with a paper dealing with the subject of contractors' and wiremen's unfamiliarity with wiring rules. Fred Vore, Pasadena's chief inspector, recited a number of problems caused by overloaded food market wiring which have become less of a problem since a recent fire. He also told how a minor break in a wire caused the heating of water pipes for a considerable area and narrowly missed being the cause of a fire.

Gas range lamps, clocks and other electrical equipment again came in for discussion. O. W. Barnwell, chief inspector at Beverly Hills told of a bulletin he had just issued to all wiremen as to the requirements that city would demand in such installations. In Beverly Hills, he pointed out, such wiring on ranges will be required to be connected through rigid or flexible conduit. It was brought out that the chief difficulty has been found to be that the cords are run carelessly over or near the flue vent, become greasy and frayed and are likely to break down and charge the frame of the range. Mr. Ufer told of steps being taken by one local manufacturer; Arthur Kempston pointed out that no standards are yet set up for testing ranges and that the initiative rests with some range manufacturer to submit a range to the Underwriters Laboratories for the establishment of such standards.

Mr. Kempston told of the new identification by a painted edge on the approved fittings made by his company, National Electrical Products Co.; R. A. Maxwell, of Electrical Products Corp., makers of luminous tube equipment, told of the operating characteristics of his company's new Lumenarc tubes. H. V. Dobson, Santa Barbara's inspector, told of the need for greater publicity of inspector's work, and of cooperation with the fire chief's association. "There has been much unauthorized and dangerous home installation made during the last five years. Reinspection is badly needed. We will never in the world get it done if we do not bring the public to appreciate its need and to *want* it done," he said.

After luncheon two talks were heard from members of the faculty of Cal-Tech. Prof. Royal W. Sorenson, head of the electrical engineering department, talked of the well rounded course of study given even specialized engineering students today in order to prepare graduates to market their services to industry. Such broad training, he showed, though some of the specific training may not be so thorough, will make a graduate more adaptable and hence of more real value to his future employer. Mr. Sorenson also outlined some of the research activities at Cal-Tech, illustrating this part of his talk with slides. Later he conducted the group to the high voltage laboratory where a number of demonstrations of high voltage discharges and some startling exhibitions of the destructive force of lightning discharges were made. Wire as evaporated in one pistol-shot crack, or pieces of wood were virtually exploded by the great surge of current sent through them.

Dr. T. H. von Karman, professor of aeronautics, who has charge of the tests being conducted by the institute for the Metropolitan Water District, described the purposes and general procedure of these tests. He modestly claimed no superior knowledge of pumps over that of manufacturers who had spent lifetimes in such work, but pointed out that pumps had been developed somewhat arbitrarily to fit certain standard speeds and horsepower ratings of motors or other prime movers. Apparatus which he described has been set up at Cal-Tech to give extreme range of speed variation from ½ r.p.m. to 3,000 r.p.m. and complete tests are made of the speed, torque, capacity and head of a wide range of types and kinds of pumps in the hope that a gain of efficiency of even as much as 2 per cent will result, which over a long period of years of pumping Colorado river water for the district will amply repay the research and benefit the public. A visit to this testing laboratory was also made, where the members saw tests under way.

The May meeting of the chapter will be held at Long Beach, where Chief Inspector Newcomb has promised a repetition of last May's excellent meeting there. Inspector Tracy of Redlands was tentatively booked for the November meeting, after the Southwestern Section convention at San Diego exposition in September.

•

...in the Motor Shop

Motor Dealer Group Committees Named

F. E. Boyd, chairman of the Electric Motor Dealers' Ass'n of Northern California, re-arranged the committee set-up of that organization and definitely set forth the purposes of the various committees.

First is the executive committee which, in addition to Mr. Boyd, consists of L. J. Douat, T. L. Rosenberg, F. O. Sievers and E. J. Douglass, whose duties are to advise the officers, coordinate the activities of other committees, handle finances and membership matters. This committee is composed of the chairmen of the other standing committees and one member-at-large.

The sale and rental committee is headed by L. J. Douat and prepares rata and policy material in relation to sales and rentals of used equipment.

Pumps From Junk

G. C. Wagner, motor specialist of Olympia, Wash., as mentioned in the September issue, has built up a nice side line in small pumping equipments made out of junk parts. He sells these pumps at $25 each just about as fast as he can gather the parts. The picture shows him with one of these pumps, which delivers a barrel of water a minute at heads of from 12 to 15 ft.

A winding and repair committee, headed by T. L. Rosenberg, studies and prepares data relative to rewinding and repairing of motors.

An industrial relations committee, headed by F. O. Sievers, handles all matters relative to other associations and branches of the industry, as well as code matters.

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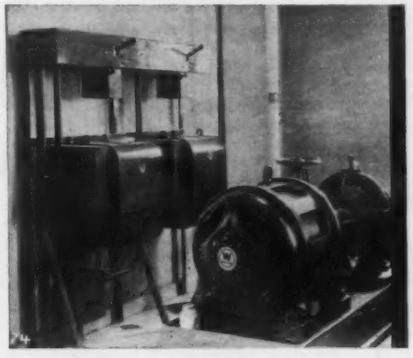
Compact



Compactness and a neat looking installation is provided in a Western industrial plant where the oil switches are mounted as an integral part of the wiring gutter as shown in the accompanying illustration. A slot cut in the face of the gutter allows the handle of the switch to protrude

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...in Lighting

Cooperative Department Makes Lighting Boom

THE most interesting department at Public Service Co. of Colorado is that operated by Dana W. Rowten. It doesn't even carry an official name, though its scope is national; indeed, foreign correspondence routed through this office is nothing unusual.

Rowten, himself, constitutes the entire personnel. His job is to provide free consulting service to individuals, to independent dealers, electrical contractors, utilities, in and out of Colorado, communities, manufacturers and others who have outdoor lighting problems to solve. He goes further than that on his own time, by actually designing installations for contractors, locally, in order that power facilities may be adequate to handle potential requirements. His work is cooperative in the broadest sense. He does no direct selling, having graduated from that very important sphere of activity when demand for his specialized knowledge became so great that routine work was disrupted.

In other words, he created a job for himself by knowing one thing extremely well. Several years ago, while selling

Dana Rowten consults with customers to foster lighting

flood lighting to filling stations and other night-operating concerns, he devised a portable mast for demonstration purposes. This invention has been widely adapted in all parts of the country.

More recently, he devoted his energies almost entirely to night lighting of athletic fields. To his dynamic promotional work is largely due the tremendous spread of softball in the West—a vogue that has "caught on" elsewhere since manufacturers, power companies and baseball devotees have labored in harmony to develop this thrill-giving sport.

Having established himself as an authority on this type of lighting, Rowten was called upon by groups, organizations and communities outside of Denver for specifications on foot-candles, height and location of poles, types of lamps, amount of connected load to properly illuminate "kittyball" diamonds. So great became the demand for this information that the company's engineering department made blueprints showing all details. These were sent to all inquirers, regardless of whether they were tributary to Public Service Co's power lines.

Last Spring, when the Rocky Mountain Electrical Assn. began its yard and garden lighting contest in Denver, Rowten was appointed consultant for anybody desiring advice on outdoor installations around the home. He cooperated, gratis, with home owners, contractors, dealers, manufacturers' agents and factory representatives who tied in with the activity. The new service employed what little remaining time he has been able to give to direct selling. So he was relieved of other duties and instructed to "serve the public."

Rowten's one-man department has broader significance than appears at a casual glance. It provides a business-developing contact with power companies; it cements relationships with the public; it is the friendly meeting place for members of the electrical industry who formerly regarded the utility with jaundiced eye. It goes far beyond the local picture in serving manufacturers and jobbers. It represents the sort of cooperation which, if generally fostered, will aid privately-owned utilities in their efforts to maintain a strong position against political encroachments.

•

• TELEPHONE ORDERS for "Trilite", an indirect lamp with two-filament bulb, are being booked in large numbers by the B. C. Electric Railway Company, or at least what in practically every case amounts to an order. The company is using large newspaper space to feature these lamps and offering a free trial in the home, the lamp being sent out on receipt of a phone call. Special terms of $1.00 down and $1.50 per month on the electric light bill are quoted, and these easy terms coupled with curiosity over the new lamp which causes persons to request a home trial are bringing in many orders.

•

• CENTRAL ARIZONA LIGHT & POWER CO., Phoenix, is running a series of blind advertisements in the newspapers in its territory featuring Better Light-Better Sight. The reader is invited to call the company's phone number for a free light survey of his home.

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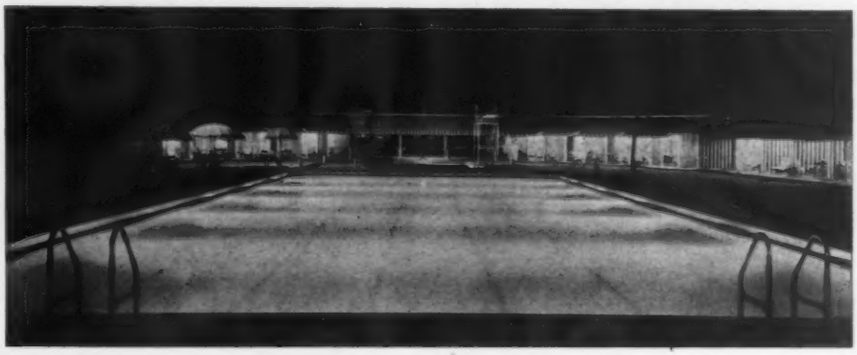
Coronado Pool Aglow

The light from ten G. E. 1000-watt, dry-niche floodlights spreads a soft glow through the clear, inviting water in the new outdoor swimming pool recently installed at the Hotel Del Coronado at Coronado Beach, Calif. An interesting feature of this thoroughly modern 40 by 100-ft. pool is that it is supplied with sea water drawn from the ocean and stored in a large well. A motor-driven pump circulates the water for purification purposes



...in Merchandising

Range Prospects Secured By Bridge Luncheons

AN UNUSUAL plan for increasing range sales was recently put into effect by the Los Angeles Bureau of Power and Light. Under the new arrangement, any electric range user can repay social obligations with a bridge luncheon prepared and served by the representatives of the Bureau right in her own home. Her only responsibility is to select either seven or eleven guests for the luncheon.

All of the food, bridge tables, linen, silverware and dishes are provided without cost by the Bureau, the luncheon being prepared, served and the dishes washed by its representatives. After the meal, Mercedes Gaffney, in charge of demonstrations, gives a short talk on electric cookery, explaining its advantages and conveniences. The hostess then may proceed with the afternoon's entertainment.

Sometime later one of the Bureau's range salesmen calls upon the hostess and secures the names of the guests who are then contacted as range prospects. The electrically prepared luncheon, plus the talk afterward, has proved an effective means of gaining interest in electric cookery. Needless to say, the idea is very popular with Los Angeles range users who can arrange for the luncheon merely by calling the Bureau and selecting a day suitable to both parties. The Bureau feels confident that the modest expenditure incurred with each luncheon is more than justified by the additional names of interested prospects it has been able to add to its lists of potential range users.

●

Los Angeles Holds Electric Range Week

Electric Range Week, described as a first annual event, has just been completed from March 25 to 30 in the Los Angeles City Bureau of Power and Light territory. Range dealers, department stores, manufacturers and distributors met with Chet Dye, of the Bureau, and Jack Morse, of Dan B. Miner Co., advertising counselors, to set forth the program for a concentrated drive on electric ranges during that week.

Results of the sale have not yet been tabulated but from the indications at press time it was highly successful. Advertising of the Edison company, mentioned elsewhere, also had its impetus in the drive as did the excellent sales training which has been going on under the auspices of the utilities of southern California and distributors of ranges.

In the large advertisement used a spring note was given to the copy by the slogan "Spring Comes Into the Kitchen to Stay." New styles, new colors and new low terms were also advertised.

●

Vancouver Newspaper Installs Model Kitchen

"The Province Modern Kitchen" will shortly be opened on the second floor of the Province Building in Vancouver, B.C., by the Vancouver Daily Province, a newspaper. The venture will include a complete electric kitchen, an auditorium capable of seating seventy-five persons, and an office service for interested parties.

The newest electric equipment of the Canadian General Electric Company will be a feature of the service.

A regular cooking school and a culinary expert of outstanding reputation will be two more attractions offered in connection with the kitchen.

●

• SEARS, ROCBUCK AND CO., in Salt Lake City, Provo and Ogden, Utah, advertises that if the customer has no banking connections it will make loans under N.H.A. plans for home improvements.

●

... in Contemporary Reading

FIRST AID FOR THE AILING HOUSE—A book by Roger B. Whitman, Published by Whittlesey House, McGraw-Hill Book Co., Inc., evidently deals with houses built in the Dark Ages and to be lived in in continued darkness. In its complete list of practical ideas and suggestions for the upkeep and maintenance of a home, the only reference to electrification in any respect comes in one paragraph on one page listing eight suggestions for repairs to lighting and power. Perhaps, and the idea is a good one, it is intended that electrical work will not be done by the householder but that competent electrical contractors will be called in to make such repairs and replacements as are needed. Except from the electrical standpoint, the book is a very useful compendium of methods and ideas for the householder and includes everything from heating and ventilation to delousing and insect control.

●

ELECTRICAL COMMUNICATION, by Arthur L. Albert, associate professor of communication engineering, Oregon State College. 448 pages; 6x9; price $5.00; published by John Wiley & Sons, Inc., 440 Fourth Ave., New York. Thoroughly modern in every detail and embodying the most recent communication standards, this book is designed primarily for use both as a college textbook and as a reference book by engineers in the communication industry. Beginning with the description of various means of transmitting intelligence electrically, the book covers telephone, telegraph, and radio communication systems, the chapters on modern telephone plants and wireless communication being particularly good. The material not only presents the theory of electrical communication but correlates theory with commercial practice so that those in the communication industry engaged in administrative or supervisory activity should find the book of value in obtaining a better understanding of the engineering features of communication practice.

●

ELECTRIC POWER METERING, by A. E. Knowlton, associate editor, *Electrical World*, first edition, published by McGraw-Hill Book Co., Inc. Fabricoid bound, 6x9 in., 340 pages, illustrated. Price $4. For sale by the McGraw-Hill Retail Room, 833 Mission St., San Francisco.

Aside from a very complete treatment of electric energy metering, perhaps the most important characteristic of this book is the analytical treatment, substantiated by vectorial representation, accorded various metering problems. The presentation concentrates on the clarification of problems which call for a thorough knowledge of the principles underlying the desired performance characteristics of metering devices. An excellent contribution to the subject of electric metering, the book will be found valuable both to students and to utility departments.

●

A COURSE IN ELECTRICAL ENGINEERING—Alternating Currents—Vol. II, by Chester L. Dawes, associate professor of electrical engineering, Harvard Engineering School. Fabricoid bound, 6x8 in., 705 pages, illustrated. Price $4. Published by the McGraw-Hill Book Co., Inc., New York. For sale by the McGraw-Hill Retail Room, 883 Mission St., San Francisco.

The third edition of this book brings up to date much of the material incorporated in previous editions and includes new developments in the field of electrical engineering, primarily in the field of electronics. New developments in the field of alternating current machinery have been included together with an entirely new set of problems relating to practical electrical engineering applications.

●

• THREE PUBLICATIONS on theoretical and experimental electronics and electron tube applications have now been made available to the public at a nominal charge by the General Electric Co., Schenectady, N. Y. The first of these publications is "Electronics and Electron Tubes," describing the fundamentals underlying the vacuum tube and simple experiments illustrating these fundamentals. This publication is designated as GET-568-A and is priced at 25 cents. The other two publications, GET-566 and GET-620, deal with laboratory experiments on the electron tube theory and electron tube applications, respectively. They supplement the fundamentals set forth in "Electronics and Electron Tubes." The price of the last two booklets, sold as a combination, is also 25 cents.

●

• "ICE BY WIRE" is a new booklet written especially for children by J. H. Ashbaugh, chief refrigeration engineer of Westinghouse Electric & Manufacturing Co. The book tells in simple and analogical language the principles of refrigeration and the function it plays in preserving foods in the home. Salesmen will find it a valuable door opener.

●

• WESTERN ADVERTISING, March issue, contains a feature article on Power—The struggle for consumer favor among the public and private utility giants of the West Coast.

News of Note + + +

Washington to Vote on State Power Amendment

A constitutional amendment authorizing the state to engage in the power business will be submitted to the voters of Washington at the general election in 1936, as a result of a resolution passed by the legislature of that state. As finally passed the measure permits the state to engage in the wholesale distribution of power with an amendment to permit rural retail electrification.

Under its provisions the state power business would be administered by a non-partisan three-man board elected by the people. The state is authorized to produce, control, purchase, sell and distribute electrical energy and to develop and operate in conjunction with the United States water rights and sites for development of power plants within the state borders. It authorizes the state to bond itself up to $30,000,000 to build power transmission lines.

●

Utah Proposes Regulatory Changes

Revision of the utility regulatory setup in Utah may result from legislation considered by the State Legislature. Under the terms of one bill the present Public Utilities Commission would be discarded and a new and powerful Public Service Commission organized.

The new commission would be composed of three full-time members appointed by the governor with annual salaries of $5,000. The term of service would be six years.

A second measure passed by both House and Senate would require utilities to bear three-fourths of the regulatory expenses in the state.

●

Oregon Governor Vetoes State Power Bill

Veto by Governor Charles H. Martin of Oregon of the so-called Ickes-Grange Power bill ended the hectic career of that measure in its oscillating course through the state legislature just adjourned. Starting out as a House bill after much working over in committee, it went to the Senate where it was rewritten and passed as a Senate bill, reaching the House again to be passed in the closing hours of the session, and finally coming to the Governor's desk after adjournment.

The bill provided for an elective commission of three having broad powers to build transmission lines, condemn power properties and issue revenue bonds. It was intended, according to its proponents, to place the state in a position to contract for Federal power at Bonneville and distribute this power widespread throughout the state. Provision for the taxing of such state owned property was included.

Among reasons given by the Governor for vetoing the bill were the following: that the bill bore little resemblance to the original Ickes suggestion for facilitating rural electrification, and did more resemble the Grange measure repudiated by the people at the last general election; that although the bonds provided in the measure were revenue and not general obligation bonds, nevertheless there would be a moral obligation on the part of the state with respect to them that would impair the state's credit, particularly in view of the provisions for taxing the properties covered by the bonds; that the bill implied the state's willingness to assume the financial burden of building transmission lines from Bonneville in the face of a strong possibility that the Federal government will assume this responsibility; that the powers granted to the commission were too sweeping and that no control over the commission's acts was provided; and that the bill was premature in that it attempted to lay down a policy with respect to the distribution of Bonneville power prior to the establishment of Federal policy on this point and prior to completion of economic studies by the State Planning Board.

The Governor suggested that Bonneville power would not be ready for distribution until early in 1938 which would give plenty of time for the 1937 legislature to act intelligently and in harmony with Federal policy, which should by that time, be known.

●

• San Francisco Voters will pass upon a proposed charter amendment legalizing the issuance and sale of revenue bonds for the acquisition or construction of public utilities at a special election to be held sometime in the near future. Instead of a two-thirds majority as is required at the present time for general obligation bonds, the new plan would permit the issuance of utility revenue bonds on the basis of a majority vote.

●

• Redwood City asked the California Railroad Commission for a valuation of Pacific Gas and Electric Co. distribution system in the city. The move is said to be with the idea of purchasing the system for a municipal operation.

Ickes to Investigate Hetch Hetchy Contracts

Investigation of contract arrangements between the City of San Francisco and the Pacific Gas and Electric Co. for the distribution of power generated in plants on the Hetch Hetchy water supply project has been ordered by Secretary of the Interior Ickes. A public hearing has been called for May 6 in Washington, D. C.

Public ownership advocates have long contended that the present power distribution plan violated the terms of the Raker Act under which San Francisco was given the right to develop a water supply in Yosemite National Park. The contract arrangement has been highly profitable to the city, resulting in earnings in excess of $2,000,000 per year which have been used for bond interest and redemption charges for the water project.

●

Court Orders Valuations Before Rate Reductions

Rate reductions cannot be ordered by the state Department of Public Works without property valuations, the Washington State Supreme Court has ruled. It sustained a Thurston County Superior Court decision reversing a departmental order reducing wholesale rates charged by the Puget Sound Power & Light Co. to the City of Port Angeles.

The power company contended before the supreme court that it was not receiving a fair return on its investment and that the rate cut aggregating $25,000 a year was confiscatory. The court held that insufficient facts were presented to justify the department's action in reducing the rate.

●

Domestic Rates to Be Reduced in Seattle

Reduction of one-half cent per kw.-hr. in the primary rate for domestic customers has been recommended to the Seattle City Council by J. D. Ross, superintendent of the Municipal Lighting Department. An ordinance putting the reduction into effect within forty days is being drafted. The new rate calls for 5 cents per kw.-hr. for the first 40 kw.-hr. instead of the previous figure of 5½ cents.

The reduction will be met by the Puget Sound Power & Light Co. which serves 36,860 customers in the Seattle metropolitan area where the new City Light schedules will be effective. The reduction will average approximately 20 cents per month.

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New Commissioner Named for Oregon

Frank C. McColloch, attorney of Baker, Ore., was appointed State Public Utilities Commissioner of Oregon's one-man utilities commission by Governor Charles H. Martin, February 28. He succeeds Charles M. Thomas, an attorney from Medford, Ore., who was appointed by Governor Meier four years ago when the law was passed changing the former three man commission to a one man commission.

Principal matters of unfinished business pending in the office of the Commissioner at the time of Mr. McColloch's appointment are two contested orders involving the valuation and rates of the Pacific Telephone & Telegraph Co. and of the Northwestern Electric Co., both of which are in the Federal Court pending hearings.

●

Edison Stockholders Hear Meeting Via Radio

Utilizing its privately-owned telephone system as a transmission network, the Southern California Edison Co. on March 15 inaugurated an entirely new form of utility company stockholder's meeting by holding twelve broadcast network-linked meetings simultaneously. Proceedings of the thirty-ninth annual meeting at the Edison Building in Los Angeles were brought to group meetings of stockholders via wired radio over the company's lines.

At each receiving point the addresses and other proceedings of the general meeting in Los Angeles were heard through the audio system of radio broadcast receivers by means of phonograph pickup facilities. From the Edison Building, the program was carried over trunk lines to the company's communications department center at Alhambra and rebroadcast from there to each of the receiving points where the meetings of stockholders were held. The receiving points were Lancaster, Long Beach, Pasadena, Pomona, San Bernardino, Santa Ana, Santa Barbara, Santa Monica, Ventura, Vislia and Whittier.

"The great interest manifested by stockholders this year in company affairs prompted the Edison management to arrange this unique means of holding simultaneous meetings," said Harry J. Bauer, president of the company. "Stockholders thus were saved the time and effort that might be entailed in attending a meeting some distance from their homes."

The stockholders unanimously re-elected the present board of directors, composed of Mr. Bauer, president of the company; C. A. Buffum, George I. Cochran, John H. Fisher, Albert W. Harris, A. N. Kemp, Fred B. Lewis, A. J. McFadden, Ben R. Meyer, W. C. Mullendore, Donald O'Melveny, James R. Page and Henry M. Robinson.

The board of directors, at their organization meeting following the stockholders' meeting, re-elected officers as follows: Mr. Bauer, president; Mr. Mullendore, executive vice-president; Mr. Lewis, vice-president and general manager; Roy V. Reppy, vice-president and general counsel; C. M. Trott, vice-president in charge of finance; W. L. Frost, vice-president in charge of sales; Will H. Fischer, vice-president in charge of public relations; B. T. Story, treasurer; B. F. Fluno, comptroller, and Clifton Peters, secretary.

●

San Joaquin Announces Further Rate Reductions

For the fourth time within twelve months San Joaquin Light & Power Corp. has announced changes in rate schedules providing for reduction. The latest schedule approved by the California Railroad Commission placed domestic lighting customers residing in incorporated cities served by the company on a combination rate with a low energy block of 1½ cents per kw-hr. as against a previous low block of 3.7 cents per kw.-hr. Under the old lighting rate the charge was 4½ cents for the first 200 kw.-hr. with all excess at 3.7 cents. Under the new schedule the first 30 kw.-hr. are at 4½ cents the next 140 kw.-hr. 3½ cents and all in excess of 170 kw.-hr. at 1½ cents.

Domestic lighting customers residing in rural areas qualify for this rate under the program known as the "special inducement" offer announced a year ago. At the same time it was announced that the "special inducement" offer would be continued for customers in this classification for one year beginning June 1.

In filing the new schedule, the company stated that as a result that the several rate offers announced during 1934 the characteristics of use in homes in its territory has changed significantly. Average kilowatt-hour consumption for domestic lighting customers increased 55 kw.-hr. in 1934 over 1933.

●

• CONSTRUCTION CREWS of the Six Companies, Inc., have begun work on the two big diversion tunnels around Parker damsite, 150 miles below Boulder Dam. Parker Dam will form the reservoir from which the Metropolitan Water District will divert Colorado River water into the aqueduct to Los Angeles. Litigation and physical interference with construction activities by Arizona has been temporarily stopped by a U. S. Supreme Court order.

Commission Reports on Markets for Power from Bonneville Project

Two reports, one signed by a majority of four, the other by a minority of three members of the Bonneville Commission of the State of Oregon, are bound in the recently printed report of that commission relating to prospective uses of the power developed at the Federal project on the Columbia River at Bonneville near Portland. The commission of seven, appointed by Governor Meier of Oregon pursuant to a 1933 legislative resolution, is headed by D. C. Henny, nationally known consulting engineer of Portland. Three members concurred with Mr. Henny in the majority report. The minority report is signed by John H. Lewis, former state engineer, and two attorneys.

The two reports diverge on the kind of use most likely to absorb Bonneville power soon and on the manner of distributing it. The majority report finds that the best chance of economic utilization lies in attracting heavy energy-consuming industries to a point near the dam site; the minority advocates state-wide distribution over state-owned transmission lines.

The majority report defines the market area most likely to be affected by Bonneville and analyzes the power supply and use in that area, finding a substantial surplus capacity over present needs. In seeking economic uses, the report analyzes domestic and industrial possibilities and irrigation. In the domestic field it finds average annual use in the market area equals 1,110 kw.-hr. against the national average of 604 kw.-hr., and concludes that the domestic market does not offer a particularly promising field for the consumption of a large portion of Bonneville power unless means of working out house heating economically can be found.

In its discussion of house heating, the report finds two draw-backs leading to the conclusion that little confidence should be placed in the rapid utilization of electric energy for this purpose: (1) The extremely low price (below cost) at which the energy would have to be sold to compete with the existing fuels, and (2) the high price of present equipment for utilization. Low annual load factor of this load is shown to contribute to the cost of serving this business.

The most promising field for economic utilization of Bonneville power is found to be in the heavy power-consuming industries such as metals, pulp and paper, and chemicals. The existence of certain raw materials, tide water transportation at the dam site, and other favorable factors are balanced against distance from prospective markets for the finished product and other unfavorable factors in the discussion of prospective uses in these three major industries. From this analysis the report found that the greatest possibilities appeared to exist in the development of aluminum, aluminum alloys, iron and steel, ferro alloys, high grade spruce pulp products, and various chemicals and fertilizers.

The report recommended that the Federal government be urged to construct a transmission line from Bonneville to Portland and to announce as soon as possible promotional rates necessary to attract heavy industries. It further recommended that the state investigate (1) resources for manufacturing processes likely to be established; (2) the methods and policies by which the benefits of cheap Bonneville power may be realized to their fullest extent, including increased domestic uses; (3) the method of transmission and distribution and the extent such undertakings should be financed and built by the United States, the state of Oregon, or by existing utilities.

The minority report reached the conclusion that the largest potential market for Bonneville power is in the homes and farms of Oregon, and that the next largest market is in the light industry widely scattered throughout the state. It concurred with the majority report that a very important future market is in the heavy electric base industries and chemicals. The report advocated a state owned and operated transmission network covering the entire state, and an inter-state network constructed by the Federal government.

Its recommendations were all directed to the 1935 session of the Oregon legislature just convening at the time the report was published. The legislature was asked: (1) to petition the United States government to construct an interstate power transmission system connecting all public and private plants in the Northwest; (2) to create an elective state power commission to prepare a plan for development of transmission and distribution of power; (3) to adopt a plan for state-wide power transmission, showing on a map the lines to be constructed and designating their order of importance; and (4) to petition the United States to charge not less than 50 per cent of the cost of the Bonneville development to navigation, deferring amortization of the cost of the power part of the project for 50 years.

Following the issuance of the report, a sub-committee of the Oregon Planning Council, affiliated with the National Resources Board, considered the divergent views of the majority and minority report and passed a resolution recommending further surveys, investigations and studies to determine the most economic and beneficial means of distributing Bonneville power, and further studies of the most beneficial uses of this power. The resolution asked further that this investigation include a study of the feasibility of constructing inter-state transmission lines connecting the chief industrial centers of the Pacific and the Northwest.

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• THE CITY COUNCIL of Walla Walla, Washington, and officials of the Pacific Power & Light Co. have been asked by the Walla Walla Chamber of Commerce to negotiate looking toward the installation of a $11,000 ornamental street lighting system. In case the power company would bear the expense of the installation, it is suggested the city extend the company's franchise for a 10 or 20-year period.

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• HUBBELL & WALLERS, electrical engineers, Alaska Building, Seattle, have been commissioned to prepare plans for a $118,000 municipal, 1,000-hp. hydro-electric plant for Seward, Alaska, and actual work on the plans, it is stated, awaits allocation of Federal funds for the project. The Mayor of the Alaskan city is now in Washington, D. C., in the interest of the enterprise.

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• A BILL PROVIDING $50,000 for preliminary surveys and engineering work on the Central Valley (Calif.) Water Project has been signed by Governor Merriam.

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• SAN FRANCISCO'S Board of Supervisors approved a resolution to investigate disposition of power from Red Mountain Bar power house which will cost San Francisco at least $1,000,000 in addition to what the city has already invested in the Hetch Hetchy project.

•

• NEVADA'S ASSEMBLY adopted a resolution asking the Federal Power Commission for a complete survey of all public utilities in the state. Data is to be used by municipalities in seeking lower rates or municipally operated plants.

Los Angeles Plans $769,810 Expenditure

Construction work, estimated to cost $769,810, on the Los Angeles municipal electric system in preparation for receiving Boulder Dam power, has been authorized by the city's Board of Water and Power Commissioners. Of this amount $395,810 will be expended for betterments, extensions and replacements on the system, including overhead and underground wiring and additions to distributing stations. This work is already under way. The proposed work will include construction of a distributing station at Eagle Rock to cost, with electrical equipment installed, $241,000. This work started in March. Work on a similar station in the Pacific Palisades district, to cost $133,000, is scheduled to start in April.

On the Boulder canyon power transmission system practically all the steel towers have been erected, from the damsite on the Colorado River to within 40 miles of Los Angeles, according to E. F. Scattergood, chief electrical engineer and general manager of the Bureau of Power and Light. Work of erecting the double circuit towers from a point west of Canjon Pass to a connection with the system in Los Angeles soon will be started.

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• ARIZONA EDISON CO. of Phoenix, which has been operating under a federal trusteeship, has applied to the United States District Court and the Arizona Corporation Commission for permission to reorganize. The application is based on a general improvement in business conditions and in the operations of the company.

Court Rules Company May Pay Dividends

The Supreme Court of the state of Washington sitting at Olympia en banc, has rendered a decision in which it declared that privately owned public utilities doing an interstate as well as an intrastate business are exempt from the provisions of a law passed by the 1933 legislature giving the state Department of Public Works authority over the payment of dividends and issuance of securities by utilities.

Following enactment of the law, the Washington Water Power Co. brought suit to determine the validity of the law. The Thurston County Superior Court held that the 1933 act was valid against all utilities operating in the state under the jurisdiction of the department. The company, declaring that one-fifth of its business is in Idaho, contended that the act gave the department an unwarranted right to interfere in the management of its business. In reversing the decision of the lower court the State Supreme Court held the act clearly shows the intent of the legislature was to apply the act's provisions only to utilities engaged in intrastate operations. The decision clears the way for the payment of a common stock dividend by the Washington Water Power Co.

"Our directors passed a resolution to pay at the end of 1933 a common stock dividend of 3 per cent," states Frank T. Post, president of the company. "We did not ask the state Department of Public Works for an authorizing order because we did not think it had jurisdiction. To test the question we brought suit against the department to prohibit it from interfering with the payment of such a dividend. No question as to the issuance of securities was involved."

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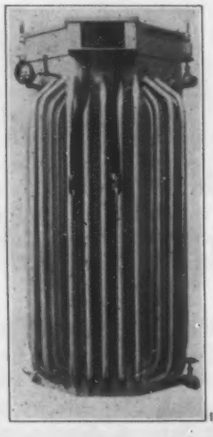
Colorado Company Cuts Power Rates for Mining

As an incentive to greater use of electricity Public Service Company of Colorado has announced a cut of twenty-five per cent in the power rate applying to Clear Creek and Gilpin counties. The reduction is based on connected load. Previously, the first step was two cents per kw.-hr. on loads from 200 to 600 hp. This step was cut to 1.5 cents and similar reductions made on other industrial and commercial schedules. Domestic rates are unchanged.

A further announcement by W. A. Freeman, local manager at Idaho Springs, is to the effect that Public Service Co. will furnish transformers, lightning arresters and other equipment on line extensions to mines where power is to be used.



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Rate Reductions Ordered in Arizona

As a result of compromises between the Arizona State Corporation Commission and the Central Arizona Light and Power Co., electric and gas rates are to be reduced in Phoenix April 1. This action climaxes a legal battle which started last September when the Commission ordered reductions totaling $325,000 which the company contested in the court.

Under the revised schedules electric rates will be reduced approximately $200,000 a year. The new schedule includes a daily service charge of 2.5 cents with kilowatt-hour charges of 4½ cents for the first 70 kw.-hr.; 3.8 cents for the next 150 kw.-hr.; 3 cents for the second 150-kw.-hr. and 2 cents for all additional energy. A new combination electric rate carries a daily service charge of 7.5 cents with 3 cents per kw.-hr. for the first 250 kw-hr.; 2½ cents per kw.-hr. for the next 250 and 2 cents for all over 500 kw-hr. A substantial reduction was also made in the commercial lighting rates.

Under the terms of the compromise, suits which have been pending in the Maricopa County Superior Court and in the Circuit Court of Appeals will be dismissed.

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Organizations Propose Colorado River Authority

Creation of a Colorado River Authority to control the development and use of the river's water has been endorsed by representatives of six southern California organizations interested in the project. A resolution was adopted calling on the California Legislature to memorialize Congress and other Colorado River basin states to consider the establishment of such an authority to have general control of the river's water development and use. The Utah State Legislature, it also announced, has already momorialized Congress.

Organizations represented at the Los Angeles meeting included: Metropolitan Water District, Los Angeles Municipal Water Bureau, Imperial Irrigation District, Coachella Valley County Water District, Palo Verde Irrigation District and San Diego Water District.

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Northwest Towns Study Bonneville Power

Representatives of several small communities tributary to the Columbia River near the Bonneville power development met in the Portland, Ore., city hall at the call of the Mayor of Portland, March 4, to consider means for securing benefits of Bonneville power for their communities. Resolutions were passed asking the Federal government to construct transmission lines and pledging local cooperation in making facilities available for local distribution.

The conference organized itself into "Bonneville Interstate Public Power Development League", electing Joseph K. Carson, Jr., mayor of Portland, its chairman. The conference arranged to meet again in Portland May 6.

Out of about 50 in attendance, one-half the delegates represented 15 or 20 small communities, the balance being representatives of local public ownership leagues and various other interested organizations. None of the larger cities in either state was represented.

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P.G.&E. Gets SEC Approval For 45 Million Refunding

Approval has been received from the Security Exchange Commission by the Pacific Gas and Electric Co. to embark upon a $45,000,000 financing program. The new bond issue will be used to refund outstanding securities and will yield 4 per cent, the present interest charges being 5½ per cent.

This large financing program, the first in several years among Western utilities, was approved after a dramatic race against time across the country. To permit the bonds to be offered to the public before the company gave the required 60-day notice of a bond redemption on June 1, registration papers had to be filed with the SEC before March 8. Two sets of the papers were sent by air to Washington, D. C., one plane being grounded in Sacramento and the other at Cheyenne. Nevertheless, the papers arrived in Washington at 11:30 p. m. on Friday, March 8, in time to permit the new issue to be released to the public 3 days before the call for refunding had to be made.

It is also reported the Southern California Edison Co., Ltd., is considering refunding a $68,000,000 issue, although details are not yet available.

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• FORMATION of the Central San Joaquin Utility District is proposed in a measure to be voted upon in five precincts in the vicinity of Fowler at an election on April 23. The proposal is sponsored by the Fresno County Pomona Grange and the Fresno County Farm Bureau. The territory is now served by the San Joaquin Light & Power Corp.

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• A. W. COPLEY, Westinghouse Electric & Manufacturing Co., San Francisco, gave a talk to the combined Electric Club and Engineers' Club, of Oakland, recently on the subject of Boulder Dam.

Financial Change Proposed By Northwestern Electric

Acceptance of a plan to defer the maturity of Northwestern Electric Co. first mortgage twenty-year sinking fund, 6 per cent gold bonds for ten years asked of the bond holders by letter from Paul McKee, president, dated Jan. 25, 1935, has been making satisfactory headway. This issue, in the aggregate amount of $8,793,600, of which $6,656,000 are in the hands of the public, matures May 1, 1935. This is the only secured indebtedness of the company, which has a book value of plant and property in excess of $27,000,000.

The proposal asked the deposit of the bonds in exchange for a negotiable certificate of deposit before March 1, 1935, pending approval of the plan, automatically, by the deposit of 95 per cent of the issue, when the original bonds will be returned to owners with suitable endorsement extending the maturity date to May 1, 1945, with the additional 10 year's 6 per cent coupons attached. The board of directors may make the plan operative after deposit of 90 per cent of the bonds, or resort may be had to section 77B of the Federal Bancruptcy Act, amending procedure under which corporations may be reorganized. The May 1, 1935 interest will be paid on deposit of the bonds.

Sinking fund provisions of the original issue are to be continued for the 10-year period. Through the operation of this fund in the past, $2,137,000 of the bonds have been purchased and are being kept alive so that the interest paid on them operates to swell the sinking fund for the purchase of more bonds. During the 10-year extension period the sinking fund will purchase an additional $2,920,000 of the bonds at 100.

During the extension period no additional bonds will be issued; no payments will be made on the principal of the company's unsecured indebtedness to American Power & Light Co., amounting to nearly $3,000,000, nor will the American company demand any payment; no dividends will be paid on common stock except as funds for this purpose may be made available from earnings and earned surplus subsequent to Dec. 31, 1934, and then only on condition that an equal amount of such dividend be paid into the sinking fund for retirement of the bonds ; no dividends will be paid on the preferred stock of the company without contemporaneously paying into the bond sinking fund an amount equal to ⅛rd of such dividend.

Large institutional organizations were the first to deposit bonds.

Puget Sound Employees Vote for Wage Bargaining

By a moderate majority, production employees of the Puget Sound Power & Light Co. voted to be represented in collective bargaining with the company by the International Brotherhood of Electrical Workers, according to an announcement made by the Seattle Regional Labor Board, which conducted the election.

Negotiations between the union and he company on wages, hours and conditions of labor will soon follow as a result of the election, it was stated. Four hundred and fifty two workers voted for the union representation and 358 expressed themselves in favor of the Mutual Benefit Association, an employees' group. Before the taking of the vote, there was a threat of strike. This was averted when the company consented to a government-supervised election.

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• FORMATION of the Central Counties Municipal Utilities District to serve the towns of Corcoran, Lindsay, Porterville and Tulare with natural gas will be determined in an election to be held May 10. The project would involve the expenditure of $750,000 and would be financed through revenue bonds.

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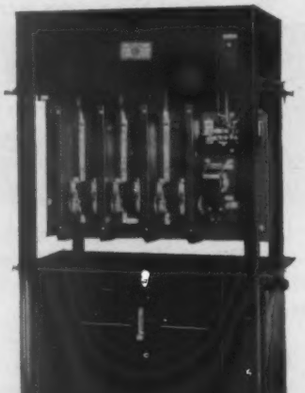

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Colorado City Again Votes for Municipal Plant

Another chapter in the long fight over public ownership at Fort Collins was written March 19 when, at a special election, voters defeated a proposed amendment to the city charter which called for indefinite delay in the acquisition of a municipal light and power plant.

The city council, since September 1932, has been authorized to build a city-owned generating plant, but failure to sell revenue bonds wherewith to finance the project caused delay. In 1933, the Public Works Administration authorized a loan of $633,000 and an additional gift of $75,000 for the purpose. Subsequently the federal offer was withdrawn when the city was unable to purchase Public Service Company of Colorado's distribution lines and equipment which was required by PWA as collateral on the loan. Condemnation proceedings several months ago resulted in a valuation of $221,500 being placed by the district court on Public Service Company's local system.

Denver investment bankers are said to have underwritten a $750,000 issue of Fort Collins revenue bonds for the purpose of erecting the municipal plant and buying the private utility's distributing system; but a group of Fort Collins taxpayers, unwilling to shoulder the debt, initiated the measure designed to defer action on the bitterly-fought enterprise.

The amendment was defeated 2,746 to 2,165.

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• CONSTITUTIONALITY of a 1933 law authorizing the Washington State Department of Public Works to approve or order reductions in public utilities' budgets was upheld on March 21 in Olympia by Superior Judge D. F. Wright. He decided in favor of the department in a suit brought by the Pacific Tel. & Tel. Co. and the Home Tel. & Tel. Co., of Spokane. The department has ordered more than $2,000,000 cut off various utilities' budgets for 1935, E. K. Murray, director, revealed. All must file their budgets for the ensing year with the department by November first.

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• RECOMMENDATIONS that the city of Napa enter into the electric light and power business were contained in an engineering report submitted to the city council by George B. Scheer, engineer hired for a survey. The report recommends financing to the extent of $340,000 through revenue bonds and the opening of negotiations with the Pacific Gas and Electric Co. for the purchase of the existing distribution system.

Pepco Reorganization Approved by Court

The amended plan of reorganization of the Portland Electric Power Co. was approved by the Federal court March 4. The decision followed a hearing February 11 at which representatives of the bond holders of Willamette Valley Southern Railway, a subsidiary, protested the plan on the grounds that they occupied a position in Pepco's financial structure prior to the debenture holders, and that the plan deprived them of this position. The court found that the plan protected these bondholders and was in the best interests of all security holders of the company.

The chief feature of the plan is that holders of $16,000,000 of debentures of Portland Electric Power Co. maturing in 1950 exchange their debentures for an equal amount of collateral trust income bonds maturing the same date. Willamette Valley Southern bonds in the amount of $581,000 maturing in 1939 are guaranteed by Pepco, parent company. In the reorganization plan the railway bonds will retain their lien on the railroad property and if and when any deficiency develops through foreclosure of this property, the amount of the deficiency will be made up by giving Pepco's new collateral trust income bonds to the railroad bondholders.

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• ISSUANCE OF REVENUE BONDS for the purpose of entering the utility business will require a two-thirds approval by the electorate as the result of a charter amendment passed at an election held in Alameda, Calif., March 12. Last November the voters approved the revenue bond financing plan for utility operations. The restriction just voted resulted from a proposal that the city construct a generating plant to supply energy to its municipally-owned distribution system.

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• WESTINGHOUSE ELECTRIC & MFG. CO. has received a contract amounting to approximately $500,000 for four 287.5 kv. oil circuit breakers and accessory equipment for installation at the Boulder Dam generating station. The breakers will serve as protection for the station against faults that may occur on the Boulder Dam-Los Angeles transmission line. They are to be ready for installation sometime this fall.

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• GENERAL ELECTRIC CO. has announced a reduction averaging 21 per cent in the list price of 60 per cent of all large incandescent lamps, effective April 1. The popular household types have been reduced from the retail price of 20 cents to 15 cents.

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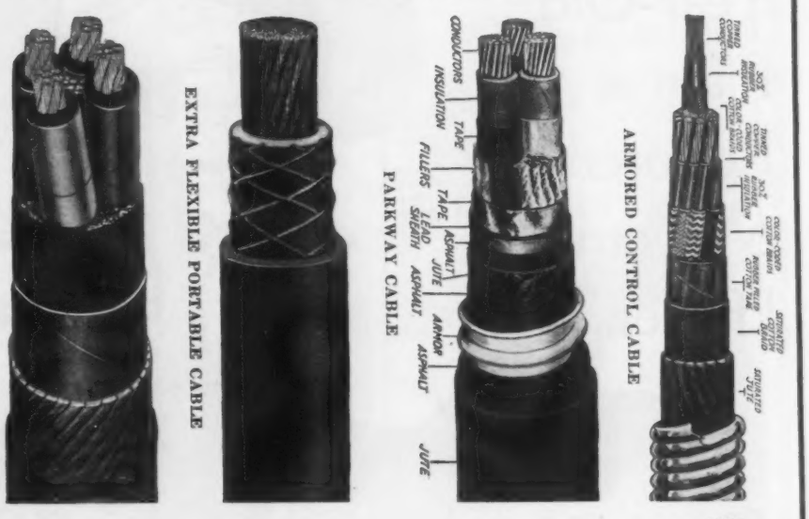

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...about the Trade

Manufacturers' Agents Form Organization

The Ben Franklin Club, an organization of electrical manufacturers and manufacturers' agents distributing through regular wholesale channels in southern California, held its charter meeting Feb. 19 at the Mayfair Hotel, Los Angeles, for the purpose of formation. Purpose of the organization will be to work together in the solution of common problems and as a unit to cooperate with other organized branches of the industry, including the utilities, wholesalers, contractors and dealers. Meetings are to be held every other Tuesday at noon in the Mayfair Hotel.

Charter members of the organization include: J. H. Pengilly and Al Schueler, of Square D Co., Inc.; Graham Holabird and Earl Stone, of National Electric Products Corp.; A. E. Clarke and Herb Mayo, of Smoot-Holman Co.; Glen Shaver, Jefferson Electric Corp.; Carl Sachs, Arrow-Hart & Hegeman Co.; H. D. Burns, Bryant Electric Co.; H. M. McMillan, Hubbel Co.; William Wilt, Bussman Fuse Co.; Clem Purviance, Okonite Co.; William Schwartz, Standard Electric Stove Co.; Kenneth Anderson, Steel & Tubes, Inc.; C. E. Thompson, Westinghouse Lamp Co.; Roy Phelan, Electrical West; Harry Marston, General Cable Corp.; William McKenna, Phelps Dodge Corp.; Charles Bluske, Economy Fuse & Manufacturing Co.; S. Larsen, Hubbard Manufacturing Co.; Frank Airey, Wiremold Co.; J. Frentress, Thomas & Betts, Inc.; V. T. Rupp, Burgess Battery Co.; Andrew O'Rear, Westwind Co.; Duke Welling, Appleton Electric Co.; Harrison H. Fogwell and William E. Cranston, Thermador Electrical Manufacturing Co.

The following officers and directors were elected for the first tenure: President, H. H. Fogwell; first vice-president, H. D. Burns; second vice-president, Carl Sachs; secretary and treasurer, Graham Holabird, and directors, in addition to the officers, Glen Shaver, K. Anderson, A. E. Clarke and Al Schueler.

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• STEWART-WARNER CORP. has announced the appointment of the Philco Northwest Distributors, of Seattle, to handle the company's complete line of electric refrigerators. Officers of the company are A. C. MacCallum, president and general manager; Harold Eskildsen, vice-president and sales manager; and John W. Roberts, secretary and treasurer.

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• H. R. BASFORD CO., distributors of Kelvinators, San Francisco region, had the unique distinction of selling 27 Kelvinators to the government for installation at the federal prison on Alcatraz Island. Only federal police boats are allowed near the island and since none of the distributors' service men could make the installation one of the guards was sent over to the mainland to take service instructions.

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• WILSON-SCHULZ, exceedingly active electrical appliance specialty firm of Stockton, recently gave up its store and moved in as a concessioner on the sales floor of the Katten & Marengo Department Store, one of the leading mercantile establishments in that city.

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• ALLEN L. BERRY CO., INC., 3945 East Ninth St., Los Angeles, factory agents for eight electric washing machines, completed an addition to its store display space in order to display Kelvinator refrigerators and Philco radios.

•

• CALIFORNIA WOOL GROWERS ASSN., at 595 Mission St., San Francisco, has been appointed representative in Northern California for the Electric Screen Corp., of 225 Durfee Road, Pico, Calif., makers of insect electrocution screens and traps.

A Thirty-Year-Old Plant is Restored to Modern Efficiency

Rehabilitation Costs Yield Large Return

This modern, high efficiency straight-flow nozzle, together with a runner of latest design, was practically all the hydraulic equipment needed for modernizing a thirty-year-old plant in California. From the standpoint of power output, operating cost, efficiency and safety, the modernized unit is far superior to the original installation, reconstruction costs having been comparatively insignificant.

Further details on this and other rehabilitated plants may be readily secured from Pelton engineers.

The Pelton Water Wheel Company

HYDRAULIC ENGINEERS

120 Broadway NEW YORK | 2919 Nineteenth St. SAN FRANCISCO | Paschall Station PHILADELPHIA

PELTON

...about People

F. J. Airey Organizes Manufacturers' Agency

Frank J. Airey, for many years Los Angeles district manager of the General Electric Supply Corp. has resigned from that organization and has formed his own manufacturers' agency to be known as the F. J. Airey Co. with headquarters

FRANK J. AIREY

at 1855 Industrial St., Los Angeles. The new agency will represent Curtiss Lighting, Inc., of Chicago, manufacturers of X-ray lighting equipment, in the Pacific Southwest. Other companies whose lines will be handled by Mr. Airey include Wiremold Co., of Hartford, Conn., the Inland Glass Co. of Chicago, and the Railway Corp.

•

• D. H. REDDINGER, resident superintendent of the Southern California Edison Co. at Big Creek, has been named to a board of consulting engineers on the 13-mile San Jacinto tunnel of the Metropolitan Water District. Mr. Reddinger was in charge of the construction of the Florence tunnel and other major bores for the Edison company in the Sierras.

•

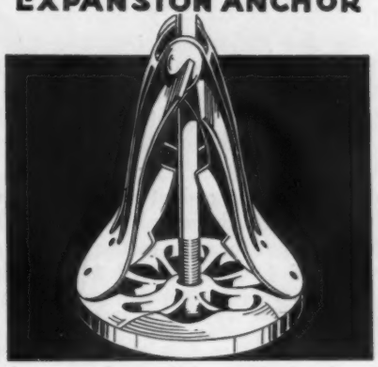
• RAY U. MUFFLEY, sales manager, Central district, Puget Sound Power & Light Co., with headquarters in Seattle, who recently succeeded Howard B. Lee as president of the Sales Managers Club of Seattle, has been elected to the board of trustees of the Seattle Chamber of Commerce.

•

• EMIL SMITH, agricultural engineer for Southern California Edison Co. in the San Joaquin Valley territory, has been brought to the main office to become agricultural advisor and have supervision of agricultural sales for the company.

WHERE TO BUY . . . IN THE WEST

HI-TENSION
4-IN-1
EXPANSION ANCHOR



Made of certified malleable iron—expands 2½ times its rated size—63% contact in firm, undisturbed earth—easily installed—maximum holding power.

Send in Your Request for Further Information

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Line Post
Insulators

Lapp Line Post Insulators eliminate radio interference due to both dirt and electro-static conditions.

Write for Bulletin No. 112 describing and cataloguing these insulators.

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Le Roy, N. Y.

McLAUGHLIN

For Telephone and Telegraph Lines.

GLASS INSULATORS

Underground Transmission
Without Conduit

Note the air and moisture proof flexible coverings. Sealtite represents a distinct advance in parkway cable construction. It is more pliable than any other underground cable . . . and costs are considerably lower.

Write for booklet offering suggested uses and explaining long life.

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Parkway and Airport Cable with Maximum Flexibility by
PROVIDENCE

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. . . . . Oak Brackets *and* Pole Steps
Safety—Strength and Lasting Economy

LOCUST PIN CO., -- Front Royal, Va.

MAYDWELL & HARTZELL
INCORPORATED
FACTORY DISTRIBUTORS
LOS ANGELES SAN FRANCISCO

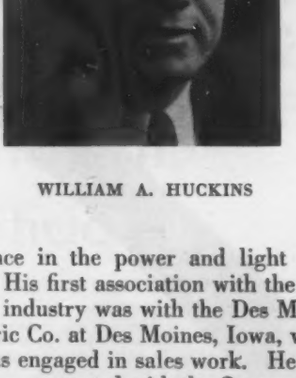
Huckins Named Sales Manager of Utah Co.

William A. Huckins, division manager of the Utah Power & Light Co. at Provo for the past five years, has been promoted to the position of sales manager of that company, with headquarters in Salt Lake City, and W. E. Fleetwood, district superintendent at Price, Utah, for the past several years, will take Mr. Huckins' place as Provo division manager. Mr. Huckins succeeds the late R. M. Bleak.

Mr. Huckins goes to his new position with a background of many years' ex-

WILLIAM A. HUCKINS

perience in the power and light business. His first association with the electrical industry was with the Des Moines Electric Co. at Des Moines, Iowa, where he was engaged in sales work. He later became connected with the Oregon Power Co. at Marshfield, Ore. He has been associated with the Utah Power & Light Co. since 1913, at which time he started in the general sales department. In



W. E. FLEETWOOD

1915 he was transferred to Ogden, Utah, where he continued to follow sales work. In 1918 he was promoted to the position of sales superintendent of the company's Ogden division. His further promotion to the position of manager of the Provo division took place in September 1930, and he has served in that capacity ever since. In his new position Mr. Huckins will be in charge of the company's sales activities throughout its entire system.

Mr. Fleetwood takes charge of the Provo division well equipped to handle the duties of division manager. His career in the electrical industry began in Colorado, where he was associated with the Delta Electric Light Co. in 1909. Upon the organization of the Western Colorado Power Co. in 1913 he became district superintendent for that company at Delta, Colorado. He was transferred in 1915 to the position of district superintendent at Ouray, where he served for about five years. In 1920 he went to Durango in the same capacity, and in 1925 moved to Telluride, continuing as district superintendent at that point. Mr. Fleetwood came to Price in 1930 as district superintendent for the Utah Power & Light Co., where he has served for the past five years. In his new position as manager of the company's Provo division he will have charge of operations in one of their largest territories.

•

• GEORGE RANKIN, who has been given a new title as director of lighting for Southern California Edison Co. Ltd., has announced several changes in his lighting staff. F. K. Sampson, a graduate architect of U.S.C. who has been covering the Beverly Hills territory in lighting, has been transferred to the general office. T. A. Esling, formerly of Curtis Lighting, Inc. in southern California, joined the Edison lighting sales forces and replaces Sampson at Beverly Hills. E. C. Frazier, formerly of Westinghouse as a lighting specialist for the company in Pasadena, was recently transferred to commercial cooking and is being replaced by W. G. Bausman, who has been in lighting sales work for General Electric Supply Corp. for the past five years.

•

• P. C. SPOWART, for many years senior contract agent for the Seattle Lighting Department, has been named to fill the position of sales manager formerly held by the late Arthur Williams. Mr. Spowart has been with the Seattle Municipal Light & Power utility for the past twenty-four years.

•

• ARCHIE RIDER, new representative of Steel & Tubes, Inc., will have charge of that company's activities in the Pacific Northwest. His headquarters will be in the Smith Tower, Seattle. Mr. Rider comes to the territory direct from the Cleveland organization of Steel & Tubes, Inc.

• C. P. BOONE has been appointed manager of the wire sales department of the United States Rubber Products, Inc., in the Pacific Coast territory. He will have his headquarters at the company's branch in San Francisco, where he will work under Harry M. Green, manager of the Pacific Coast branches. Mr. Boone is a graduate of the University of California in mining and metallurgical engineering. For several years he operated as a consulting engineer.

CHROMALOX

Replacement Range Units

increase the demand for electric ranges, by demonstrating the cleanliness, speed and economy of modern electric cookery. Every back-number range on your line indicates a subscriber liable to change to some other cooking method. Save these customers—write for our sales campaign.

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Electrical Photometrical, Chemical and Mechanical Tests. Inspection of Materials and Apparatus at Manufactory
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ARTHUR R. KELLEY
CONSULTING ENGINEER
Reports and Valuations, Public Utility Industrial Properties
Edison Bldg. Los Angeles

...in New Equipment

Luminous-Tube Transformer

Offered to the sign industry by the General Electric Co., Schenectady, N.Y., is a new luminous-tube transformer in 12,000 and 15,000-volt ratings. It is designed to save space, to give lower installation cost, greater continuity of service, and increased operating safety. The transformer is provided with wet-process porcelain terminal receptacles and removable solderless connector plugs. Optional is a length of lacquer cable already attached to the connector plugs. Complete enclosure of high-voltage terminals and connections minimizes the possibility of accidental shock.

●

Thermador Type FW Electric Water Heaters

Announcement is made by the Thermador Electrical Mfg. Co., Los Angeles, Calif., of the new type FW Thermador Everhot electric water heaters. Designed to meet the water heating requirements of the average home at the least possible cost consistent with dependable service, efficient performance, and economical operation, the models are said to be developed for the new market opened by lower electric rates. Specifications include galvanized copper-loy steel tank, granulated cork insulation, washable ivory finish. Everhot multiblade heating element and Thermalert automatic heat controls. Type FW-30—30 gallon size with single element and control lists at $59.50, and type FW-32—30 gallon size with 2-unit elements and controls lists at $69.50.

●

Ground Detector Relay

A new ground detector relay, constructed to promote continuity of service, reduce circuit breaker operation, protect line equipment from damage resulting from arcing grounds, and to help prevent telephone interference that might result from a grounded line, is announced by the General Electric Co. of Schnectady. The equipment consists of a coupler unit and a relay unit. The relay unit is operated from a Thyratron tube which in turn is operated from a Thyrite coupler connected directly across one phase of the three-phase undergrounded high-voltage line. Thyrite resistors, linear resistors, and the Thyratron tube comprise the coupler unit.

●

X-Ray "Attraction Zone" Reflectors

Development of two new X-Ray Reflectors, No. 420 "Master" and No. 530 "Monarch", has been made by Curtis Lighting, Inc., Chicago. The reflectors are designed to concentrate light on the "attraction zone" of a show window and at the same time furnish sufficient general light. They are made with "dimples" for snapping standard accessories into place.

●

Universal Adds to Electric Range Line

Landers, Frary & Clark, New Britain, Conn., are manufacturing two new Universal electric ranges featuring the "Table Top." The models are finished in full porcelain enamel with panel type doors, concealed hinges, specially constructed door handles, and automatic heat control. The oven is porcelain enamel lined and is reported to be fast, to have extra depth and added usable capacity.

New Electric Water Pump

A new pump, named the "Niagarette," is offered as a distinctly improved water system by its maker, the Decatur Pump Co., Decatur, Ill. The outstanding features are said to be the safe, efficient, and simple design of the pump, together with its being a quality product at a reasonable price. All moving parts are fully protected to prevent persons from being injured by moving parts. A guarantee of a 28-ft. suction lift is given together with a one-year guarantee covering workmanship and materials.

●

Modern Electric Water System

The Sta-Rite Products, Inc., with a new plant at Delavan, Wis., is placing on the market electric water systems to be known as the Sta-Rite line. The pumps are said to be of modern, simplified design yet new and different in appearance from other makes of pumps. New features of construction permit servicing to be done easily, economically and quickly. All models are equipped with a patented starting device that is guaranteed for one million starts.

●

Clamp Wire and Cable Lugs

Development of a new line of clamp wire and cable lugs has been made by the Burndy Engineering Co., New York, N.Y. The lugs are manufactured by a forging process which is claimed to give more strength and higher conductivity to the copper alloy used in the lugs' construction. The method of clamping is to insert the wire or cable in the serrated gripping jaws and then tightening the nut. This type of installation is said to be simple, quick, and to withstand overloads equal to the cable used. "Qiklug" is the trade name applied to the line of lugs.

G-E Electric Ranges

Featuring modernistic styling and lower prices, a line of eight electric range models has been introduced to the trade by the General Electric Co., Nela Park, Cleveland, Ohio. The price range is from $69.50 to $564 with three models under $110. Six are table top models and two are of the high oven type. All table top models are designed so they can be built in flush against the wall if it is desired to match standard cabinet construction and other kitchen equipment.

●

"Sherarduct" Floor Box

National Electric Products Corp., Pittsburgh, has announced a "Sherarduct" floor box featuring a Sherardized finish for protection against corrosion. Parts exposed after installation are of finished brass. The complete line includes rubber and brass top service fittings that are modern in design. The box, designed to provide outlets for underfloor wiring, is water and moisture proofed by means of a new metal gasket. Simple adjustment to meet the floor surface is another improvement. Two types of service fittings for lighting, heating, power and appliance circuits or for signal and telephone wiring are provided.

●

Oil-Blast Breakers for Panel Mountings

Announcement is made by the General Electric Co., Schenectady, N.Y., of new oil-blast breakers for panel mountings, designated as type FK-43. Due to the oil-blast principle of interruption, 35 per cent less floor space is required and the reliability of operation is said to be increased. The new breakers feature the enclosing of the three poles in one frame and tank, which saves time during inspection and gives a compact construction. The frame and tank are completely fabricated from a steel plate, with all joints welded. Breaker mechanism is of the internal type, and bushings are of Herkolite rather than porcelain. Only eight gallons of oil are required. The FK-43 breakers are rated at 600 amp., 15,000 volts, 1,200 amp., 7,500 volts; with an interrupting rating of 50,000 kva. at the rated voltage.

●

Cabinet Type Steel Meter Panel

Bailey Meter Co., Cleveland, Ohio, is now offering a cabinet type steel meter panel equipped with doors to protect and conceal meter and control connections. The paneled doors are provided with a 3-point locking mechanism and a cylinder lock. Panels are made of one-piece sheet steel plate formed in proper sizes to give uniform appearance regardless of the quantity or type of meters and instruments to be installed on the board, it is claimed. The panel is self-supporting but means are provided for bolting or lagging it into place.

●

A.C. and D.C. Contactors

Announcement of a new line of A.C. and D.C. contactors is made by Ward Leonard Electric Co., Mount Vernon, N.Y. The contactors have been used for several years in control assemblies and are now being offered as separate units. They are suitable for many electric control applications such as on motors, for disconnect purposes in conjunction with auxiliary switches and for electric ovens, as well as in special control panels. The features claimed for the contactors are high contact pressure with low operating and holding current in coils. For maintaining the coil circuit when momentary push button control is used, auxiliary silver to silver contacts are furnished.

...in Trade Literature

• THE STEELDUCT CO., Youngstown, Ohio, has just issued a new catalog printed in two colors, showing its line of conduit. Listed are the weights and diameters of conduit, elbows and metallic tubing. In rigid conduit there is illustrated the new Steel-duct Hot-Dip galvanized conduit manufactured by the company.

•

• RECENTLY PUBLISHED are a series of descriptive folders on the three types of Pittsburgh Standard rigid conduit made by the Enamel Metals Co., Pittsburgh, Pa. These folders describe the Pittsburgh Standard thread protected enameled conduit, the Electro-Galvanized conduit, and the new Hot-dip galvanized with zinc-coated threads.

•

BULLETIN P72 issued by Struther Dun, Inc., Philadelphia, gives a birdseye description of the company's entire line of relays, timing devices, electric counters, thermostats, electric pots and ladles, together with the engineering services they are prepared to render.

•

AN ILLUSTRATED CATALOG, describing and illustrating the various series of clock operated electrical timing devices manufactured by the Walser Automatic Timer Co., Chrysler Building, New York City, has just been released by that company.

•

THE EMERSON FAN LINE for 1935 is announced in a catalog recently published by The Emerson Electric Mfg. Co., St. Louis. The catalog describes and pictures type of fans for residential, industrial and commercial uses.

• THE BAKELITE CORPORATION, Bound Brook, N.J., is issuing a new booklet, "Bakelite Varnish, Enamel, Lacquer, and Cement, Heat Hardable." This booklet describes in detail the characteristics, uses, and technic involved in the handling of these insulating materials, all of which require baking to bring out their best properties.

•

DESCRIBING AND ILLUSTRATING the new U. S. Varidrive Motor, which is a compact unit including a constant speed motor, a variable speed device, and a gear case, a new bulletin has just been published by the U. S. Electrical Manufacturing Co., 201 East Slauson Ave., Los Angeles. Various economies effected by this latest U. S. Motor are reviewed.

•

THE CRESCENT INSULATED WIRE & CABLE Co., of Trenton, New Jersey, has issued a new catalog on Crescent electrical wires, cables, and cords. Illustrations of the manufacturing process and descriptions of the items that go to make up the Crescent line are given.

•

• INCLUDING DETAILED LIGHTING layouts for all types of installations, the S & M Lamp Co. has issued a new catalog, No. 20, illustrating and describing its complete line of open and closed type floodlights and industrial reflectors. New numbers have been added to the line and some price changes made, and clear and colored lenses are available for floodlights.

•

THE PUBLICATION of a two-color catalog, GEA-1359A, by the General Electric Co., Schenectady, N.Y., on G-E control and signal transformers, gives prospects brief information on Underwriters' standards and on how to select the proper transformer based upon the need. The use, construction, and special application of G-E control and signal transformers is also summarized.

HEATING DEVICES—The 1934-1935 offering of Hotpoint heating devices is made in a catalog bearing that name by the Merchandising Department of the General Electric Co., Bridgeport, Conn., and Ontario, Calif.

•

EDISON ELECTRIC INSTITUTE REPORTS published in recent months include Steam Generation, publication No. B8, an Oil and Gas Engines publication No. B7. Both are reports of the Prime Movers Committee of the Institute.

•

CIRCUIT BREAKER PROTECTION for alternating current motors is described in detail in the new bulletin No. 1234 of the I-T-E Circuit Breaker Co. The bulletin describes a new breaker developed by I-T-E which combines both circuit and motor protection in the same device which is said to be as rugged and trouble-free as the induction motor itself.

•

ILLUSTRATED, colored and descriptive catalogs on several G-E products has been recently issued by the General Electric Co., Schenectady, N.Y. Catalog GEK-86 describes the economies of the smaller, lighter and dependable G-E metal enclosed switchgear. Catalog GEA-1137B reviews the features, applications and specifications of the G-E indoor A-C cubicle switchgear with manually or electrically operated breakers up to 15,000 volts—and up to 2,000 amp. Information on G-E indoor disconnecting switches is given in catalog GEA-1327A. Announcement is made of the new G-E enclosed indicating and drop-out fuse cutout with new design features that insure positive action, in catalog GEA-1993. Catalog GEA-1867 gives detailed information on the applications, construction and operating characteristics of Type IKR, G-E polyphase power-directional relays. G-E watthour meters, supplies and accessories are discussed in the fifty-page catalog GEA-615C.

WHERE TO BUY IT IN THE WEST

Air Conditioning
Frigidaire Corp.
General Elec. Co.
Graybar Elec. Co., Inc.

Anchors, Guy
James R. Kearney Corp.

Appliances, Household
Apex Rotarex Mfg. Co.
Edison Gen. Elec. Appliance Co., Inc.
General Elec. Co.
General Elec. Supply Corp.
Graybar Elec. Co., Inc.
Lindemann & Hoverson Co., A. J.
Malleable Iron Range Co.
Mary Dowd Reardon Studios Ltd.
Swartzbaugh Mfg. Co.
Westinghouse Elec. Supply Co.

Boxes
General Cable Corp.
General Elec. Co.
Russell & Stoll Co.

Brackets, Wood
Locust Pin Co.

Bus Fittings
Burndy Eng'g Co.
General Elec. Co.

Buses
Aluminum Co. of America ..

Cable Accessories
General Cable Corp.
General Elec. Co.
John A. Roebling's Sons Co.

Cables
Aluminum Co. of America
American Steel & Wire Co.
Columbia Steel Co.
Crucible Steel Co. of America
General Cable Corp.
General Elec. Co.
Graybar Elec. Co., Inc.

Maydwell & Hartzell, Inc.
Providence Insulated Wire Co.
John A. Roebling's Sons Co.
Westinghouse Elec. & Mfg. Co.

Carbon Brushes
National Carbon Co., Inc.

Carbon Products
National Carbon Co., Inc.

Central Station Equipment
Tom Wood

Chimes
Square D Co., Inc.

Circuit Breakers
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Cleaners, Vacuum
Apex Rotarex Mfg. Co.
Clements Mfg. Co.
Cramer Elec. Co.

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Los Angeles, Cal.

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Jeffries Transformer Co.

Compounds, Insulating
John C. Dolph Co.
General Cable Corp.
General Elec. Co.

Condensers, Electric
Allis-Chalmers Mfg. Co.
J. G. Corrin
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Conduit
Aluminum Co. of America
General Elec. Co.
Youngstown Sheet & Tube Co.

Conduit, Underground
Fire Proof Wall Co.
Johns-Manville Corp.

Connectors
Burndy Eng'g Co.
James R. Kearney Corp.

Cutouts
James R. Kearney Corp.
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Demand Control
General Elec. Co.
Wesix, Inc.

Distribution Specialties
General Elec. Co.
James R. Kearney Corp.
W. N. Matthews Corp.
Maydwell & Hartzell, Inc.
St. Louis Malleable Casting Co.

Electrodes, Arc Welding
John A. Roebling's Sons Co.
General Elec. Co.

Fans
General Elec. Co.

Farm Electrification Equipment
General Elec. Co.

Fittings, Conduit
General Elec. Co.

Fixtures, Lighting
General Elec. Co.
Russell & Stoll Co.
Smoot-Holman Co.

Floodlighting
General Elec. Co.
S & M Lamp Co., Inc.
Smoot-Holman Co.

Fuses
Trico Fuse Mfg. Co.

Gasoline
Union Oil Co.

Generators
Allis-Chalmers Mfg. Co.
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Graphite Products
National Carbon Co., Inc.

Ground Rods
Crucible Steel Co.
Maydwell & Hartzell, Inc.

Heaters, Air
Edison Gen. Elec. Appliance Co.
Montgomery Bros.
Noblitt-Sparks Industries, Inc.
Sandoval Sales Co.
Thermador Elec'l Mfg. Co.
Wesix Inc.
Edw. L. Wiegand Co.

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Thermador - Everhot Water Heaters
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THERMADOR ELECTRICAL MFG. CO.
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Edison Gen. Elec. Appliance Co.
Lindemann & Hoverson Co., A. J.
Malleable Iron Range Co.
Sandoval Sales Co.
Thermador Elec'l Mfg. Co.
Wesix Inc.
Westinghouse Elec. & Mfg. Co.

Heating Element—Repair Part
Mend-It Sleeve Mfg. Co.
Edw. L. Wiegand Co.

Illuminating Glassware
Inland Glass Works, Inc.

Instruments, Measuring and Recording
The Bristol Co.
General Elec. Co.
Quality Elec. Co.
Roller-Smith Co.
Westinghouse Elec. & Mfg. Co.
Weston Elec'l. Instrument Corp.

Insulation
General Elec. Co.
Johns-Manville Corp.
C. D. LaMoree

Insulators
Corning Glass Works
Graybar Elec. Co., Inc.
Hemingray Glass Co.
Illinois Elec. Porcelain Co.
Lapp Insulator Co., Inc.
Locke Insulator Corp.
McLaughlin Glass Co.
Owens-Illinois Glass Co.
Westinghouse Elec. & Mfg. Co.

Ironers
Apex Rotarex Mfg. Co.
General Elec. Co.
Ironite Ironer Co.
Mary Dowd Reardon Studios
Savage Distributing Co.
Gordon E. Wilkins

Lamps, Mazda
General Elec. Co.
Westinghouse Lamp Co.

Lamps, Sun
General Elec. Co.

Lighting Equipment
Smoot-Holman Co.
Wuelker Reflector Lighting Corp.

Line Material
Maydwell & Hartzell, Inc.

Meters
The Bristol Co.
General Elec. Co.
L. A. Nott
Sangamo Elec. Co.
Westinghouse Elec. & Mfg. Co.
Weston Elec'l Instrument Corp.

Molded Material
C. D. La Moree

Motors
Allis-Chalmers Mfg. Co.
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Motor Starters
Allis-Chalmers Mfg. Co.
General Elec. Co.
Ward Leonard Elec. Co.
Westinghouse Elec. & Mfg. Co.

Oil, Lubricating
Union Oil Co.

Oil, Transformer & Switch
General Elec. Co.
Union Oil Co.

Panel Boards
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Photoelectric Cells
General Elec. Co.
Weston Elec'l Instrument Corp.

Pins, Wood
Locust Pin Co.

Pole Line Hardware
General Electric Supply Corp.
Graybar Electric Co., Inc.
Hubbard & Company
Joslyn Co. of Calif.
Kortick Mfg. Co.
Locke Insulator Corp.
Maydwell & Hartzell, Inc.

Public Utilities
California Oregon Power Co.
Idaho Power Co.
Mountain States Power Co.
Northwestern Electric Co.
Pacific Gas and Electric Co.
Pacific Power & Light Co.
Portland General Electric Co.
Puget Sound Power & Light Co.
San Joaquin Light & Power Corp.
Southern California Edison Co., L
Southern California Edison Co. Ltd.
Utah Power & Light Co.
Washington Water Power Co.

Pumps
Pelton Water Wheel Co.

Range Units
Edison Gen. Elec. Appliance Co.
L. W. Thompson
Edwin L. Wiegand Co.

Ranges
Edison Gen. Elec. Appliance Co.
General Elec. Co.
General Elec. Supply Corp.
Lindemann & Hoverson Co., A. J.
Malleable Iron Range Co.
Standard Elec. Stove Co.
Walker & Pratt Mfg. Co.

Refrigerator Parts & Accessories
California Refrigerator Co.

Refrigerators
Frigidaire Corp.
General Elec. Co.
General Elec. Supply Corp.
Graybar Elec. Co., Inc.
Malleable Iron Range Co.
Westinghouse Elec. & Mfg. Co.

Relays
General Elec. Co.
Leach Relay Co.
Ward Leonard Elec. Co.

Rheostats & Resistors
General Elec. Co.
Ward Leonard Elec. Co.
Westinghouse Elec. & Mfg. Co.

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McGraw-Hill Book Co.
Northwest Elec. Light & Power Association
Pacific Coast Elec'l Ass'n
Pacific Coast Elec'l Bureau

Signs, High Voltage
W. D. Howze Sales Co.

Strand, Guy
Crucible Steel Co.
Maydwell & Hartzell, Inc.
Pacific Wire Rope Co.

Switchboards
Allis-Chalmers Mfg. Co.
General Elec. Co.
Square D Co., Inc.

Switches, Coin Operated
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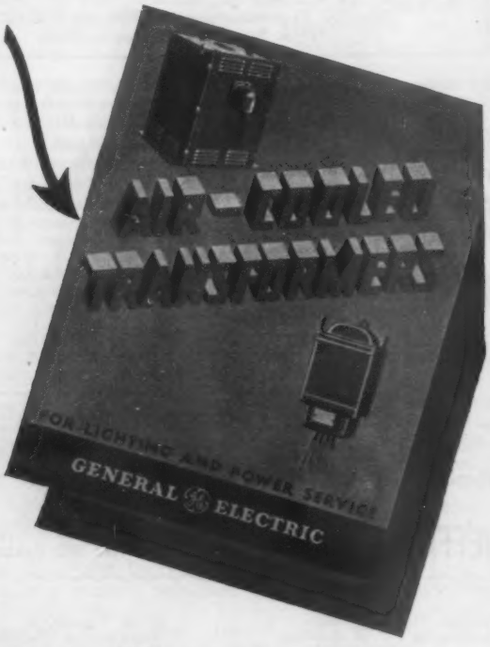

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April 1st, 1935

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Pacific Coast Electrical Bureau